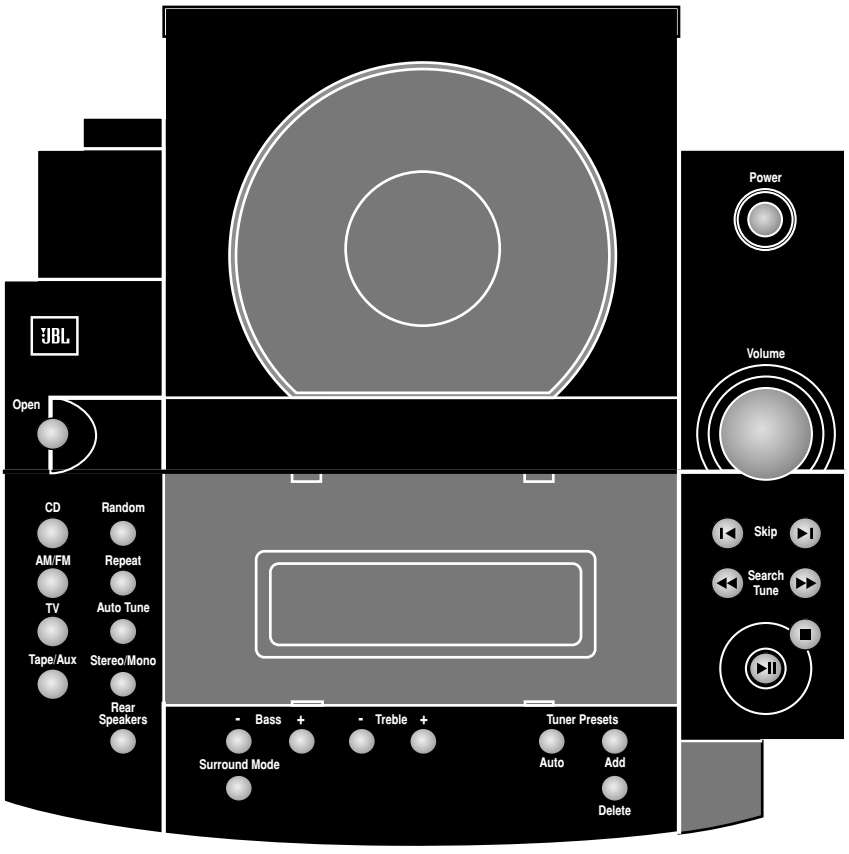
SOURCE

Dolby Pro-Logic® Surround Processor/CD Player/Tuner (Part of the ESC350 & 550 Systems)

SERVICE MANUAL



JBL Consumer Products Inc.
250 Crossways Park Drive
Woodbury, N.Y. 11797
1-800-336-4JBL in the USA

A Harman International Company

Part No.: 1112-SOURCE Rev A 4/99

LASER BEAM SAFETY PRECAUTIONS

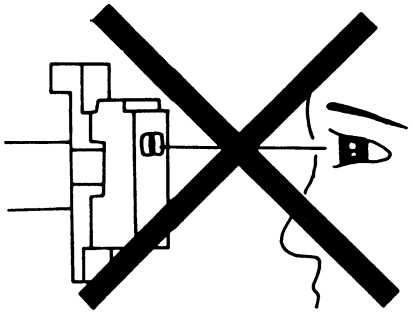
CLASS 1 LASER PRODUCT

CLASS 1
LASER PRODUCT

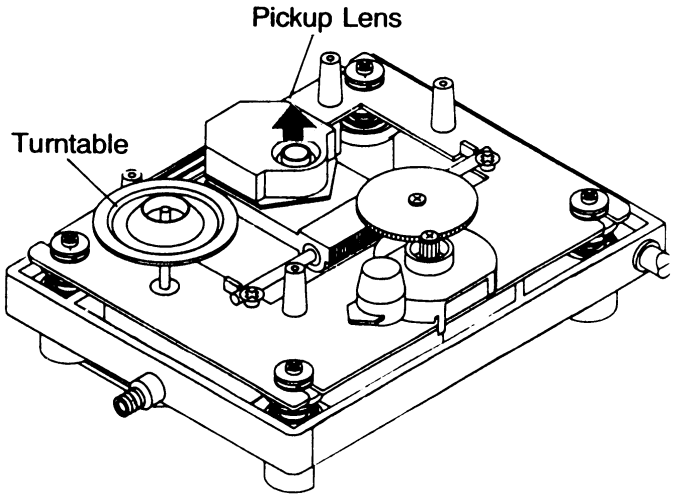
CAUTION
Invisible laser radiation when the unit is open. DO not stare into beam.

CAUTION: USE OF ANY CONTROLS, ADJUSTMENT, OR PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.



This compact disc player uses a pickup that emits a laser beam. The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 1 foot away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.



CAUTION:
Using controls and adjustment, or doing procedures other than those specified herein, may result in hazardous radiation exposure.

SAFETY PRECAUTIONS

CAUTION

RISK OF ELECTRIC SHOCK.
DO NOT OPEN.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Caution: To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Attention: Pour prévenir les chocs électriques ne pas utiliser cetre fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames prévent être insérées à fond sans en laisser aucune partie à découvert.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

HANDLING LASER PICKUP

The laser diode in the optical system of this player can be damaged by electrostatic discharge from your clothes or your body. Proper electrostatic grounding for service personal is required during servicing.

BEFORE REPAIRING THE COMPACT DISC PLAYER

Preparation

- Human Body Grounding:
  Many of the components used in this compact disc player, including the laser pickup, are sensitive to electrostatic discharge. Service personal should be grounded with an electrostatic armband (1 Mohm).

- Caution:
  Static charge on clothing does not escape through a body grounding wrist band.
  Be careful not to contact the pickup or electrical components with your clothing.

- Workbench and Tool Grounding:
  A properly-grounded electroconductive plate (1 Mohm) or metal sheet should be fitted to the workbench surface. Tools and instruments (such as soldering irons and scopes) should be grounded to prevent AC leakage.

Fig. 1

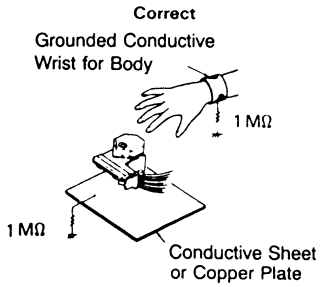


Fig. 2

Note: Laser diodes are so susceptible to damage from static electricity that, even if a static discharge does not ruin a diode, it can shorten its life or cause it to work improperly.

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FEATURES

- Built-in CD player with: ***Dolby Pro Logic surround processor, Dolby 3 stereo, 8x Oversampling***
- AM/FM tuner with ***32 presets***, ***Auto-preset function***.

SERVICE NOTE: THE ESC350 or 550 SUBWOOFER IS REQUIRED TO TEST OR PLAY "THE SOURCE" IN EITHER SYSTEM.

SPECIFICATIONS

AMPLIFIER SECTION

Signal to Noise Ratio
- AUX . . . . . 70 dB
- THD (1 KHz) 0.1%
- Head Room . . . . . > 15 dB

FM TUNER SECTION

Frequency Range . . . . . 87.5MHz - 108.0MHz
26dB Usable Sensitivity . . . . . 10 uV
Signal-to-Noise Ratio. . . . . 55 dB
I-F Rejection . . . . . 65 dB
Image Rejection . . . . . 40 dB
Limiting (-3 dB) . . . . . 15 uV
Stereo Separation (1 KHz) . . . . . 30 dB

AM TUNER SECTION

Frequency Range . . . . . 520MHz - 1710kHz
20dB Usable Sensitivity . . . . . 1000 uV/m
Signal-to-Noise Ratio. . . . . 40 dB
I-F Rejection . . . . . 40 dB
Image Rejection . . . . . 20 dB
AGC Figure of Merit . . . . . 40 dB
Selectivity. . . . . 25 dB
I-F Whistle. . . . . 10 %

SERVICE BULLETIN

Service bulletin JBL9704 - July 1997

To: All JBL Service Centers

Models: ESC550 - The Source

Subject: Surround level changes during CD search mode

In the event you receive a ESC550 system (including the Source) with the complaint that the surround level (rear channel volume) changes during the CD search mode:

Procedure:

1) Lay unit face down. Remove the 5 Phillips screws holding the upper & lower case together; separate cases.

2) Locate C707 (.022uf 50v cap.) on the main PCB in the bottom case.; replace with 470uf 10v electrolytic capacitor (JBL# 3479347121). Observe polarity; negative terminal should be closest to connector CN702. It should be possible to cut the original cap off the board and re-solder the replacement without removal of the main PCB. See drawing.

3) Locate solder pads for connector CN702 on the Control PCB in the upper case, near the headphone jack. Adjacent to the slot cut in the PCB for the 11 conductor cable, solder a .01uf ceramic cap (JBL# 3519103935) to pins 8 and 11 on the solder pads. See drawing.

4) Re-assemble unit; test as follows:

   a) Plug in unit, assure all cable and speaker connections are intact. Insert CD of choice.

   b) Turn power ON to the Source and the Bass550 subwoofer; (display on the Source should now be active).

   c) Toggle “surround mode” button on front panel or with remote control until “NORMAL” appears.

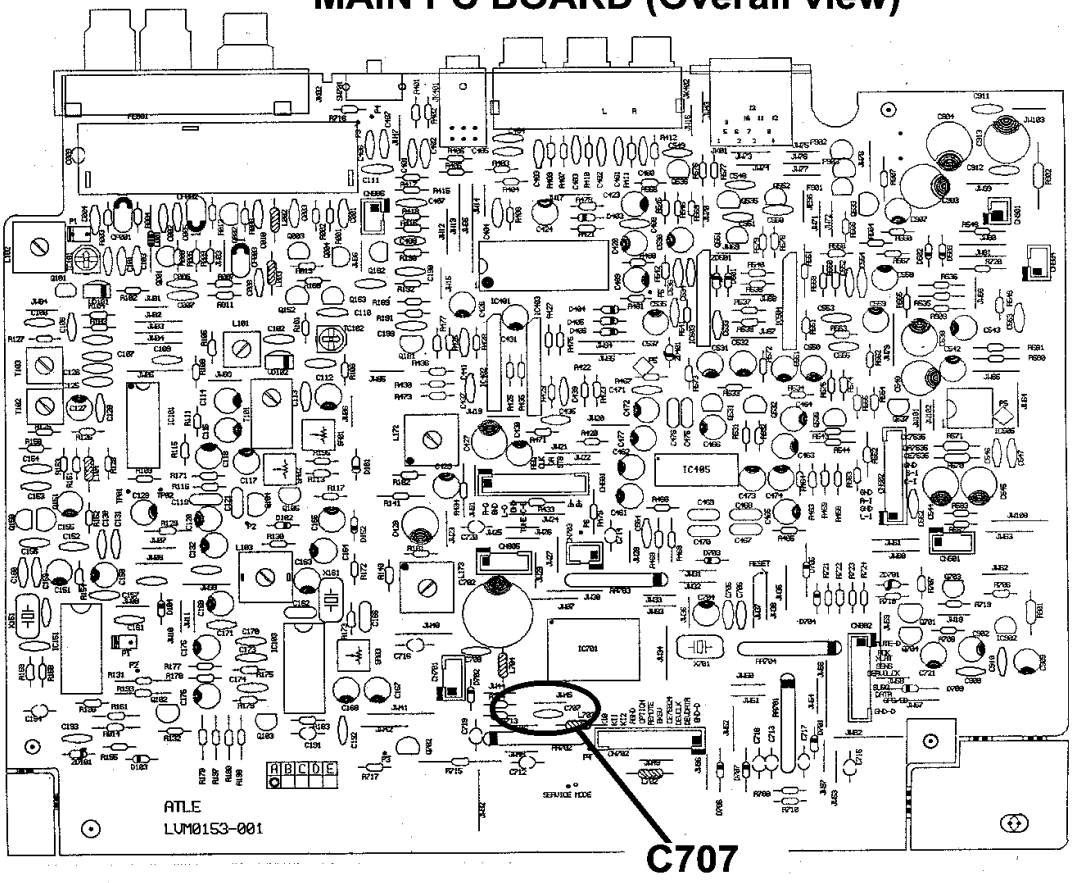
   e) Adjust volume (on the Source) so display reads “VOLUME 30”.

   d) Press PLAY button on the Source or the remote control.

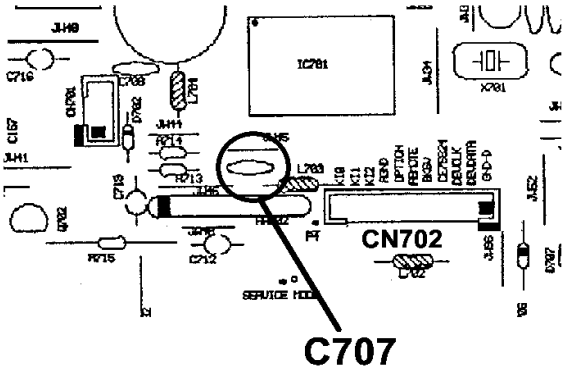
   e) Press the SEARCH/TUNE button on the Source or the remote control to search up or down selected track.

Model	Serial number	Action	Correction
ESC550 (Source)	Under 11500	Jumps randomly to surround (rear) channel level during CD search mode	Replace C707 with 470uf 10v cap. Add .01uf cap. to pins 8 & 11 of CN702
ESC550 (Source)	11500 and higher	Modified by factory	NONE REQUIRED

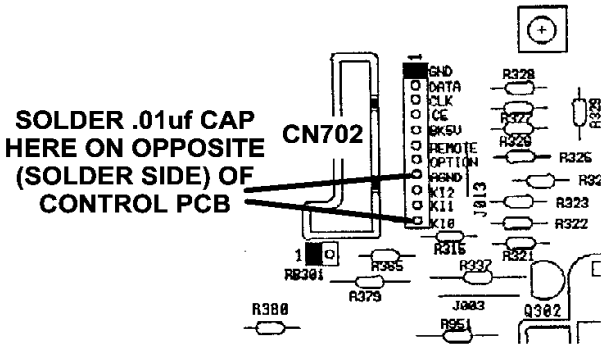
MAIN PC BOARD (Overall view)



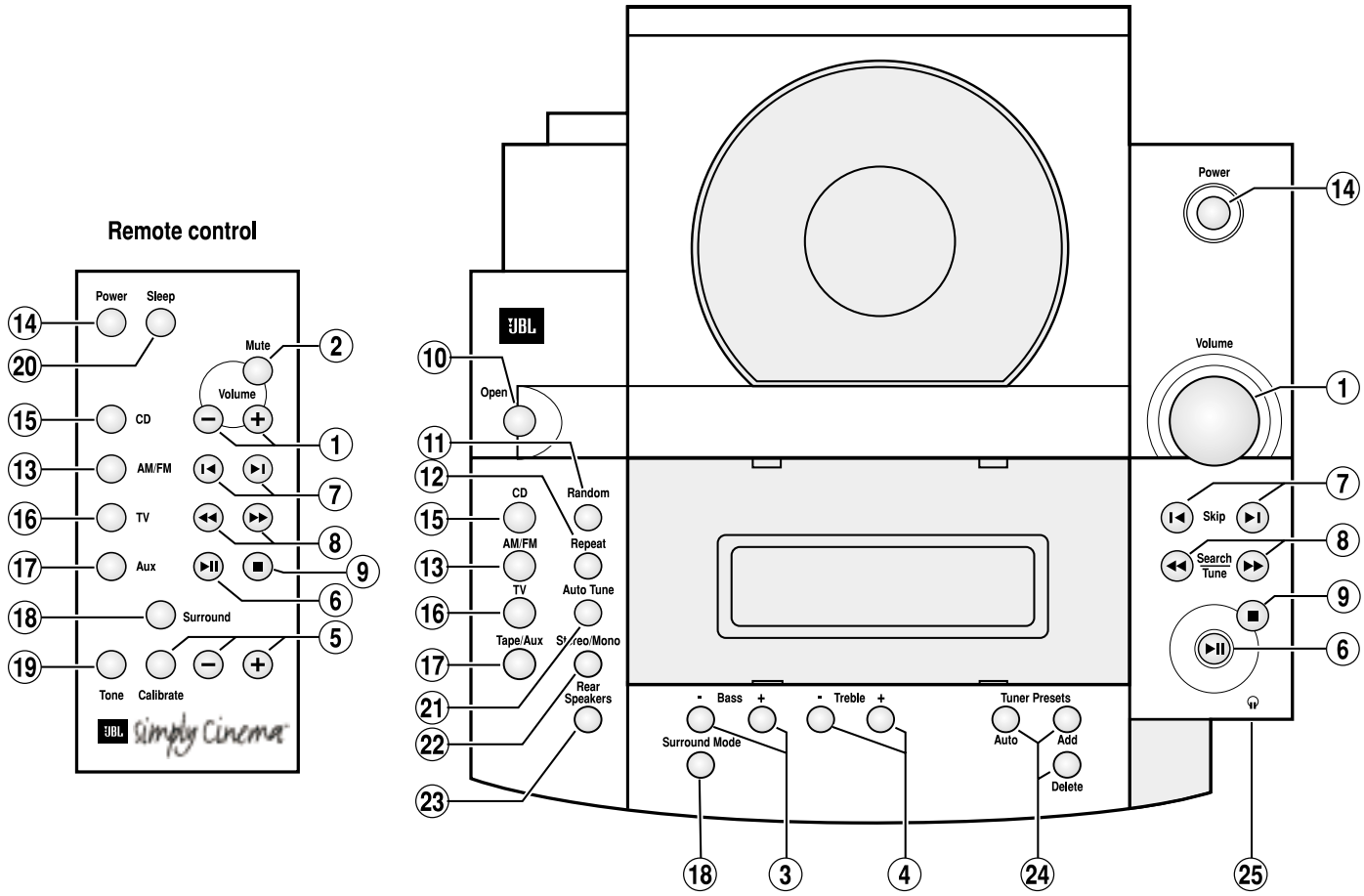
ENLARGEMENT OF MAIN PC BOARD



CONTROL BOARD (Top View)



CONTROLS AND THEIR FUNCTION



1. Volume - Turning this knob clockwise or pressing "+" on the remote will increase the volume. Turning the knob counter clockwise or pressing "-" on the remote will decrease the volume.

2. Mute - Pressing this button will mute the volume.

3. Bass - To raise and lower the bass level press these "+" and "-" buttons. See number "5. Calibration" for the same adjustments via the remote.

4. Treble - To raise and lower the treble level press these "+" and "-" buttons. See number "5. Calibration" for the same adjustments via the remote.

5. Calibration - This button operates the calibration of the "Bass", "Treble", Balance and Center Channel Volume. Press this button until the desired object for calibration (e.g. Bass) appears in the display. Press the "+" to increase and the "-" to decrease.

6. Play/Pause - Pressing this button will cause the CD to begin playing. Pressing it will a CD is playing will pause the CD until it is pressed again allowing the CD to continue playing.

7. Skip - Pressing "Back" or "Forward" will cause the CD to skip backward or forward to the next track.

8. Scan - Pressing "Back" or "Forward" will cause the CD to scan backward or forward with in the existing track being played. In the tuner mode these buttons tune the receiver to the next station, backwards or forwards.

9. Stop - Pressing this button will the stop the CD operation.

10. Open - This button will open the CD holder door.

11. Random - Pressing this button will cause the CD to be played in random order.

12. Repeat - Pressing this button will cause the CD to begin again when finished.

13. AM/FM - This button allows the switching between the AM and FM selection of the tuner. This button also switches the unit back to the tuner mode when in the CD, TV or Aux modes.

14. Power - Press this button to turn on the "Source". **NOTE:** The Source must be connected to the Bass550 subwoofer with its main power switch ON to operate.

15. CD Operation - Pressing this button will place the "Source" in CD playing mode.

16. TV Operation - Pressing this button will place the "Source" in TV operation mode.

17. Tape/Aux - Pressing this button will place the "Source" in Auxiliary mode. This is used when you have another input source connected such as a tape player.

18. Surround Mode - Pressing this button will allow you to pick between 3 different mode settings: Dolby Pro-Logic , Dolby Pro-Logic Phantom mode and 2-channel (stereo) mode.

19. Tone - This button is used to test and calibrate the performance of the system.

20. Sleep - This Button is used to turn the unit off automatically after a selected amount of time in 10 minute increments up to 90 minutes.

21. Auto Tune - Pressing this button, and then pressing either of the "Search/Tune" buttons (See #8) backward or forward will cause the "Source" to tune to the next strong signal.

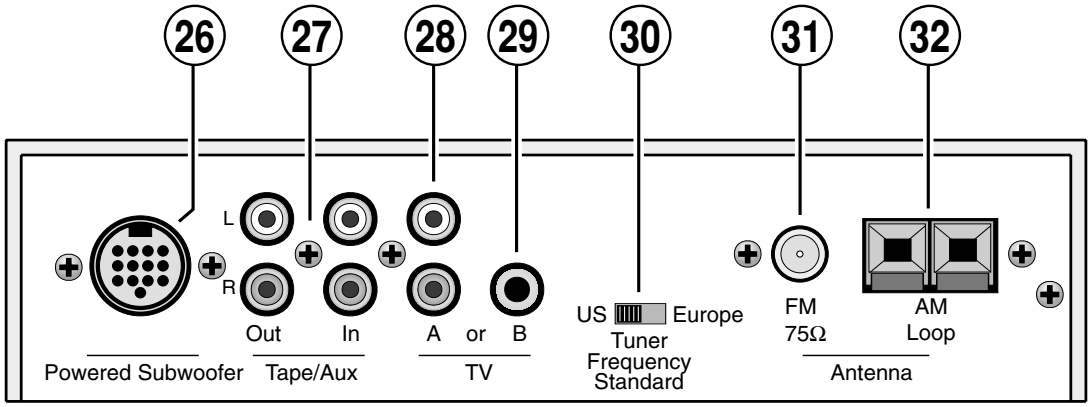
22. Stereo/Mono - Pressing this button will play the selected station without any stereo separation.

23. Rear Speakers - Pressing this button while listening in either Surround Modes will turn off the surround speakers.

24. Tuner Presets - Pressing "**Auto**" for a full second will cause the tuner to scan for strong signals and place up to 32 stations in memory as preset stations. To move across these preset stations press "**Skip**" (See #7) either forward or backward. Pressing "**Add**" will add to the preset stations the signal presently tuned. Pressing "**Delete**" will delete from the preset stations the signal presently tuned.

25. Headphone Jack - Connect a set of headphones with stereo mini-phono plug here for private listening.

CONNECTIONS



26. ESC550 Cable Connector - Plug the ESC550 cable in here and the other end into the Bass550 subwoofer.

27. Tape/Aux In/Out - Connect Tape Player or Auxiliary equipment here. The Output jacks are a Stereo fixed level signal.

28. (A) TV Connection - Connect the dual RCA stereo cable from the output of a television set here.

29. (B) TV Connection - Connect the stereo mini-phone jack from the output of a television set here.

30. Tuning Frequency - This switch determines whether the tuning standard is set for US or European standard reception.

31. FM Antenna - This is the connection for the FM cable antenna.

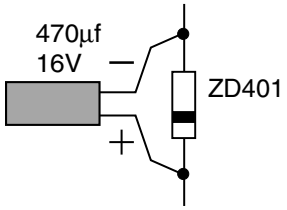
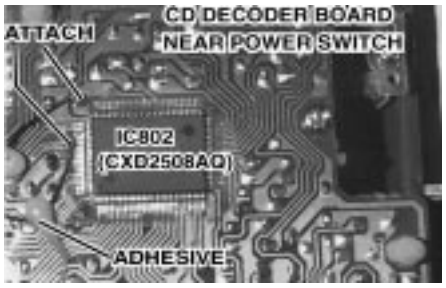
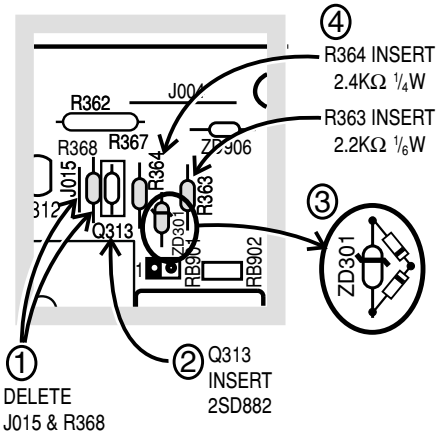
32. AM Antenna - This is the connection for the AM loop antenna.

DISASSEMBLY PROCEDURE

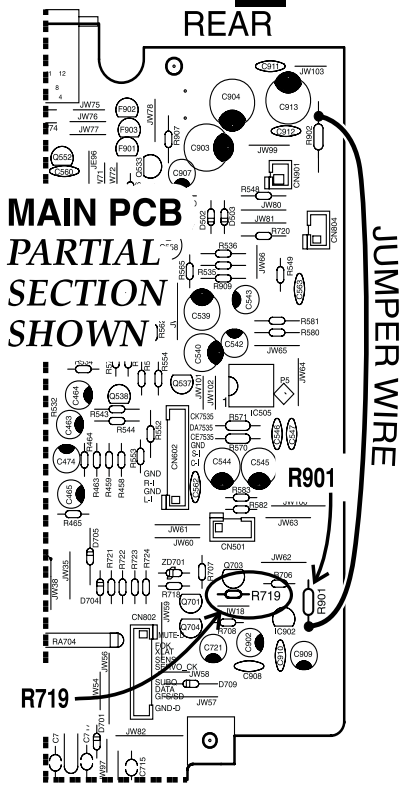
1) Lay unit face down. Remove the 5 Phillips screws holding the upper & lower case together; separate cases.

2) Remove as many molex connectors as necessary to separate case halves; do not mix up connectors during reassembly. Label if necessary.

TROUBLESHOOTING

PROBLEM	SOLUTION	DETAILS
DISPLAY BRIGHTNESS UNEVEN	Cut out R364 & R367 on CONTROL PCB	
HUM IN CD MODE	(1) Add 470uf 16v Cap. (PRE3952-471) in parallel with ZD401 on MAIN PCB; observe polarity (see drawing)	
	(2) Replace C472 (47uf 16v) with 470uf 16v cap. (PRE3952-471)	
CD PLAY INTERMITTENT - ONE CHANNEL DEAD	Add insulated jumper wire near IC802 on CD DECODER PCB pin #67 and pad exiting from corner of IC - ground. (see illustration)	
CD PLAY INTERMITTENT	On MAIN PCB, cut out C721	
CD PLAY INTERMITTENT - DISPLAY BLINKING	On CONTROL PCB, (1) Cut out jumper J015 and R368	
	(2) Replace existing part Q313 with 2SD882P NPN Transistor (RHN0882-001)	
	(3) Solder 2 pcs. Diode IN41418 (RAD4148-001) in parallel with ZD301 (see illustration). Observe all polarities.	
	(4) R364 insert and solder a 2.4 ohm resistor (or two 4.7 ohm [QAF0450-479] in parallel)	
	(5) R363 insert and solder a 2.2K ohm resistor (QAF0650-222)	

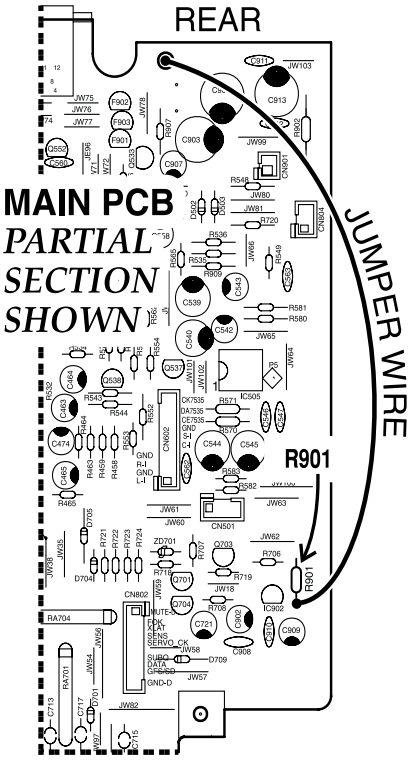
LCD DISPLAY FLICKERS & CD TRACKS ADVANCE BY THEM SELVES	(1) On the MAIN PCB, add insulated jumper from R901 (nearest C909)(+) to R902 (nearest jumper J103).
	(2) Cut out R901 (1 ohm resistor)

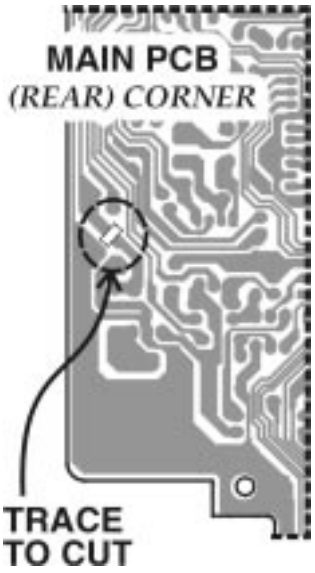


DISPLAY STAYS ON WHEN POWER OFF	On the MAIN PCB, change R719 (10k ohm resistor) to 1k ohm (QAF0650-102)

CD FUNCTION (PLAY, TRACK UP) CHANGES TO TV BY ITSELF	On the MAIN PCB, short pins 60 & 61 on IC701 together by solder or jumper wire.

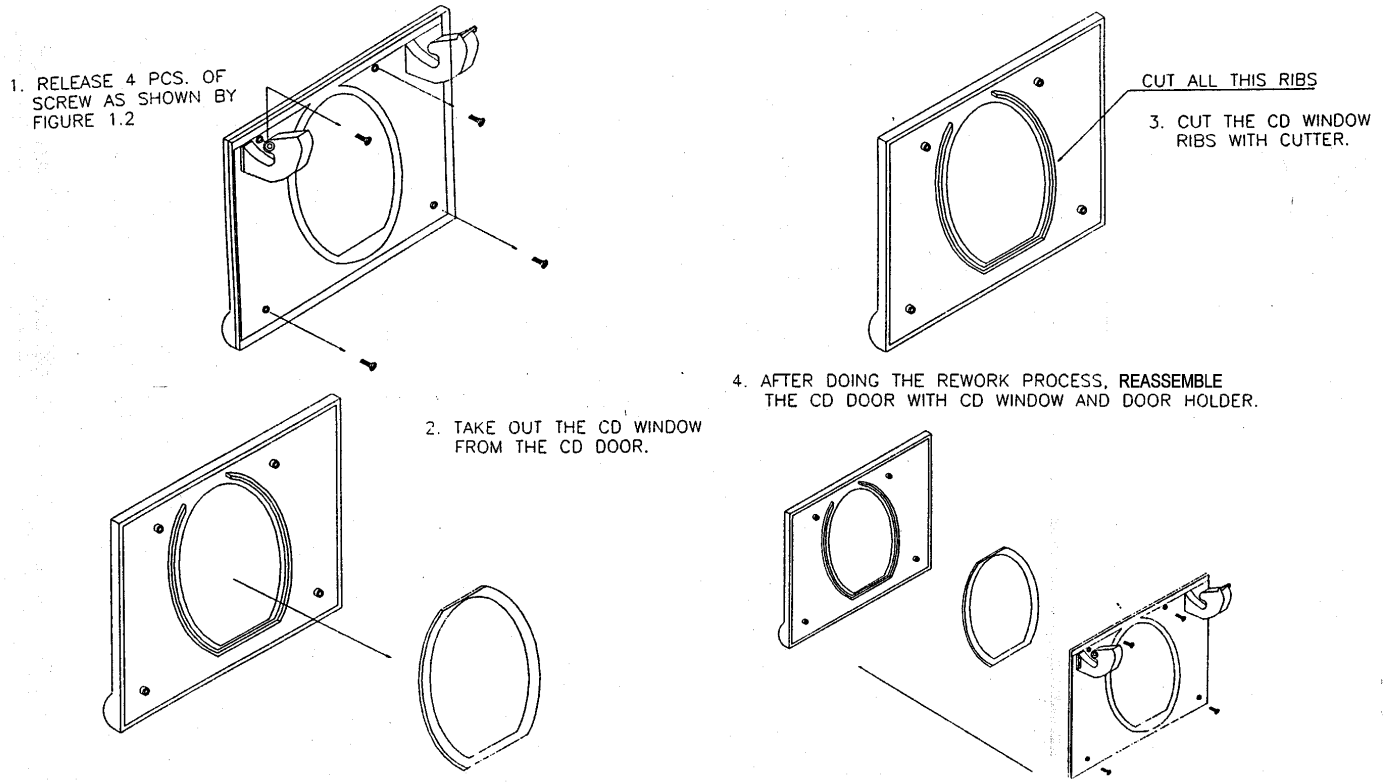
GOES TO STANDBY MODE BY ITSELF WHEN PLAYING CD's	(1) On the MAIN PCB, add insulated jumper from R901 (nearest C909)(+) to upper hole in PCB (near C912 and nearest plastic rivet) PCB will have to be removed and soldered at the rear.
	(2) Cut copper trace joining JW100 and CN804 at rear of PCB (see illustration)





WHEN CD PLAYER WARMS UP IT STOPS IN PLAY MODE	(1) On CD DECODER PCB, attach a heatsink (w/adhesive) to IC803 (KA9258D) (2) To avoid contact with heatsink on the MAIN PCB, cut TP01 & TP02 shorter (same height as IC101); push down C129, C119, & C120.

GAP BETWEEN CD DOOR AND TOP OF CABINET	FOLLOW DIRECTIONS IN ILLUSTRATION
RUBBING NOISE DURING CD PLAY MODE	
CD STUCK DURING PLAY MODE	


1. RELEASE 4 PCS. OF SCREW AS SHOWN BY FIGURE 1.2
2. TAKE OUT THE CD WINDOW FROM THE CD DOOR.
CUT ALL THIS RIBS
3. CUT THE CD WINDOW RIBS WITH CUTTER.
4. AFTER DOING THE REWORK PROCESS, REASSEMBLE THE CD DOOR WITH CD WINDOW AND DOOR HOLDER.

ADJUSTMENT PROCEDURE

Test Conditions

AM (Amplitude Modulation)

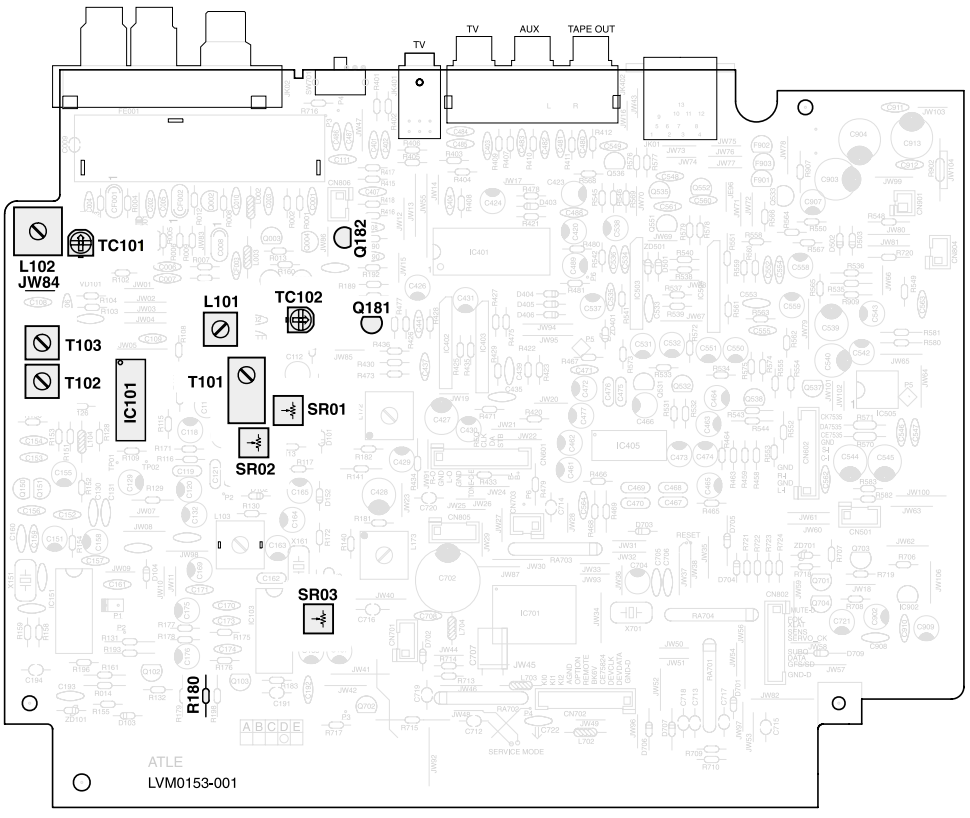
Function.....AM
Input Level 74dB/m (5mV/m)
Generator.....Modulation 30%, 400Hz

Test Condition

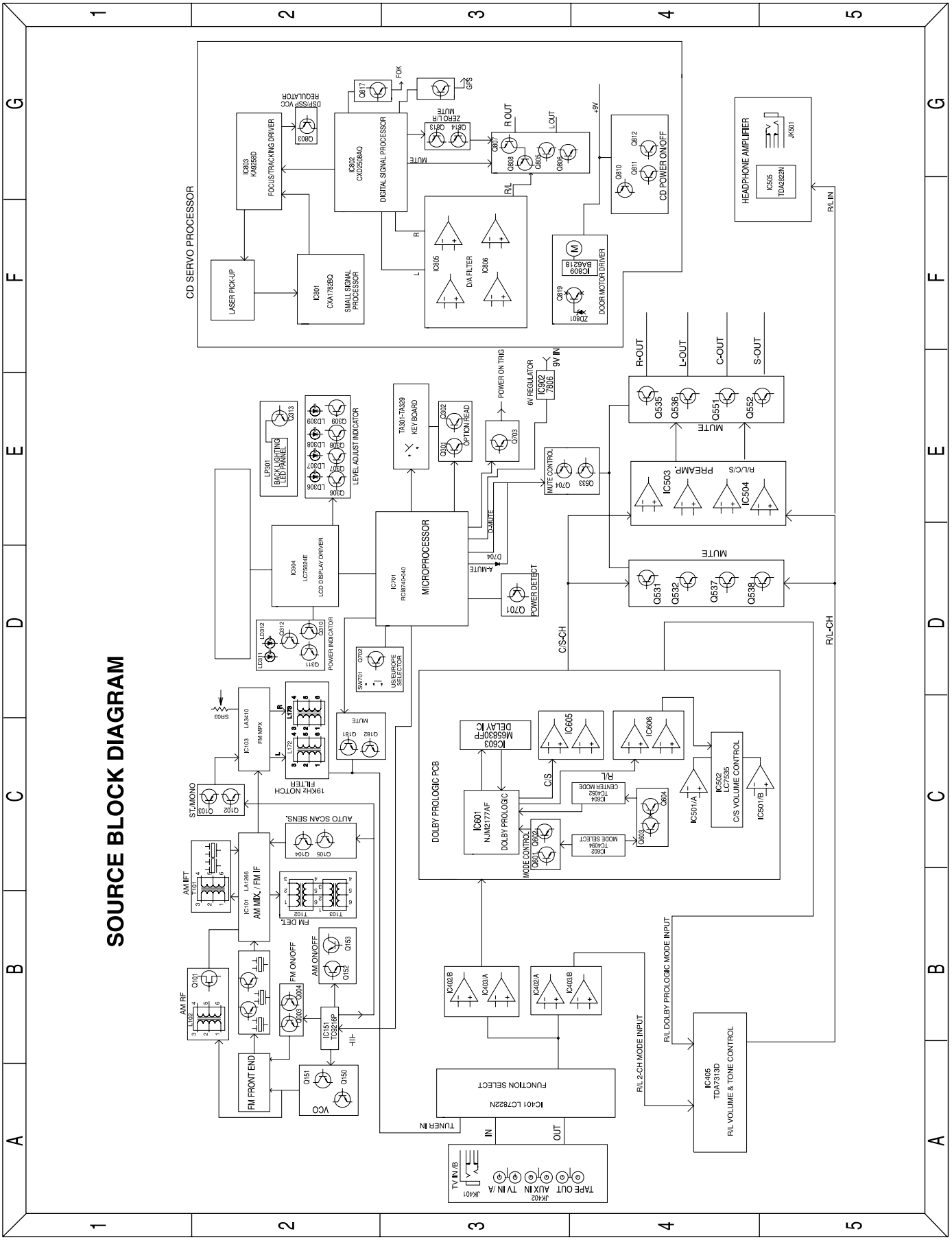
FM (Frequency Modulation)

Function.....FM
Input Level 60dB/m (1mV)
Generator .....Deviation 22.5kHz, 1kHz

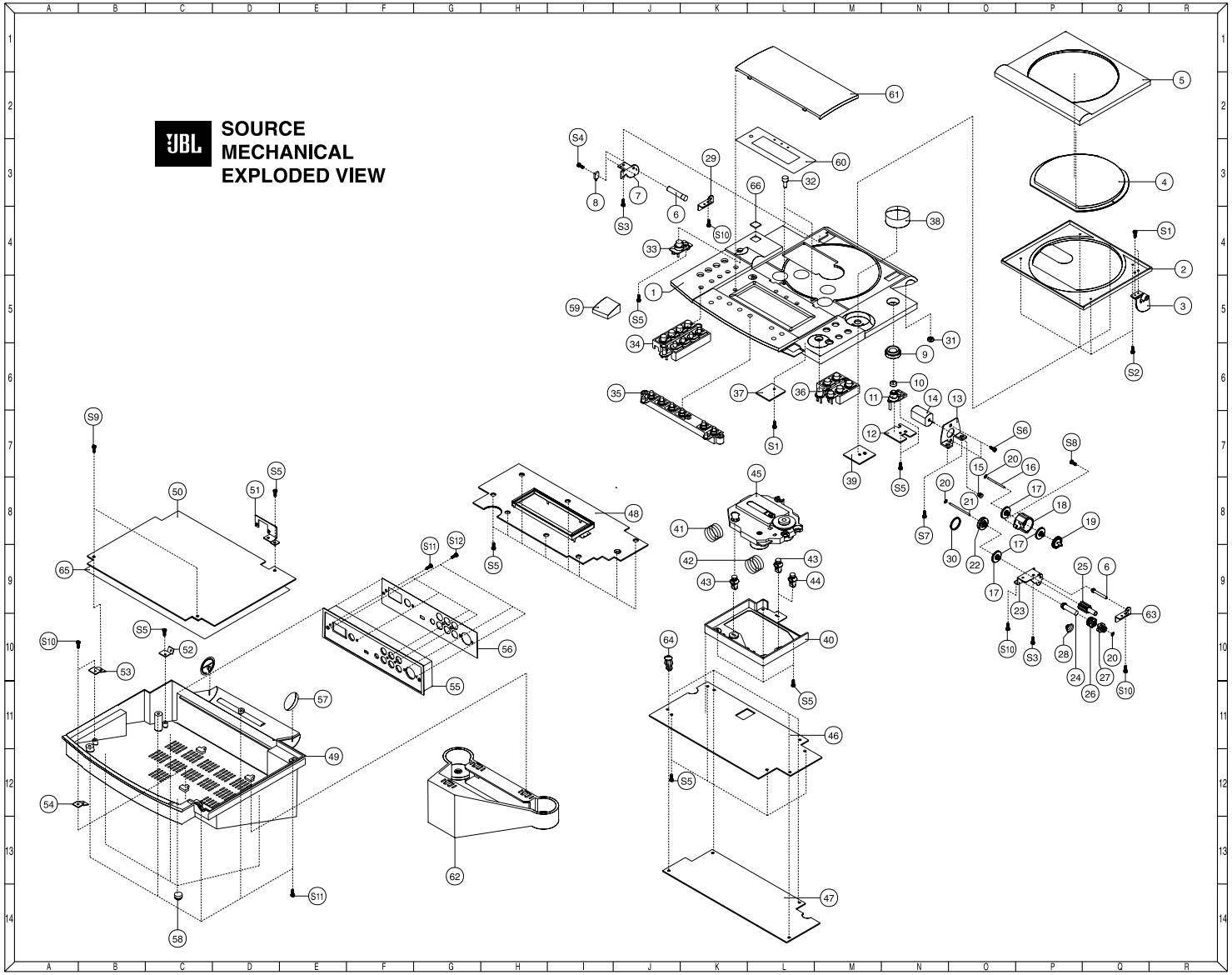
Step	Signal or Sweep Generator		Reception Frequency	Output Indicator Connection	Adjustment	Adjust For
	Connection	Frequency				
AM TUNING VOLTAGE						
1	No Signal		1710kHz	DC Digital Voltmeter JW84	TC102	10.5+/-0.1V
2	No Signal		520kHz	Same as Step 1	L101	1.2+/-0.1V
3	Repeat Step 1 and 2 a few times					
AM IF						
4	AM Loop Antenna at a distance of 24 inch (60cm) from the IRT Loop	450kHz	Point of noninterference	IF Sweep Generator IC101 Pin 12	T101	Flax and Max
AM TRACKING						
5	Same as Step 4	620kHz	620kHz	RF Sweep Generator R180	L102	Max
6	Same as Step 4	1400kHz	1400kHz	Same as Step 5	TC101	Max
7	Repeat Step 5 and 6 a few times					
FM IF						
8	To the FM antenna terminals through a matching transformer	10.7MHz	Point of noninterference	IF Sweep Generator IC101 Pin 12	T102 T103	Flat and Max Check Voltage Between R109=0V+/-30mV
FM MPX						
9	Same as Step 8	98.1MHz	98.1MHz	RF Generator Q181, Q182 “C”	SR03	Max Separation



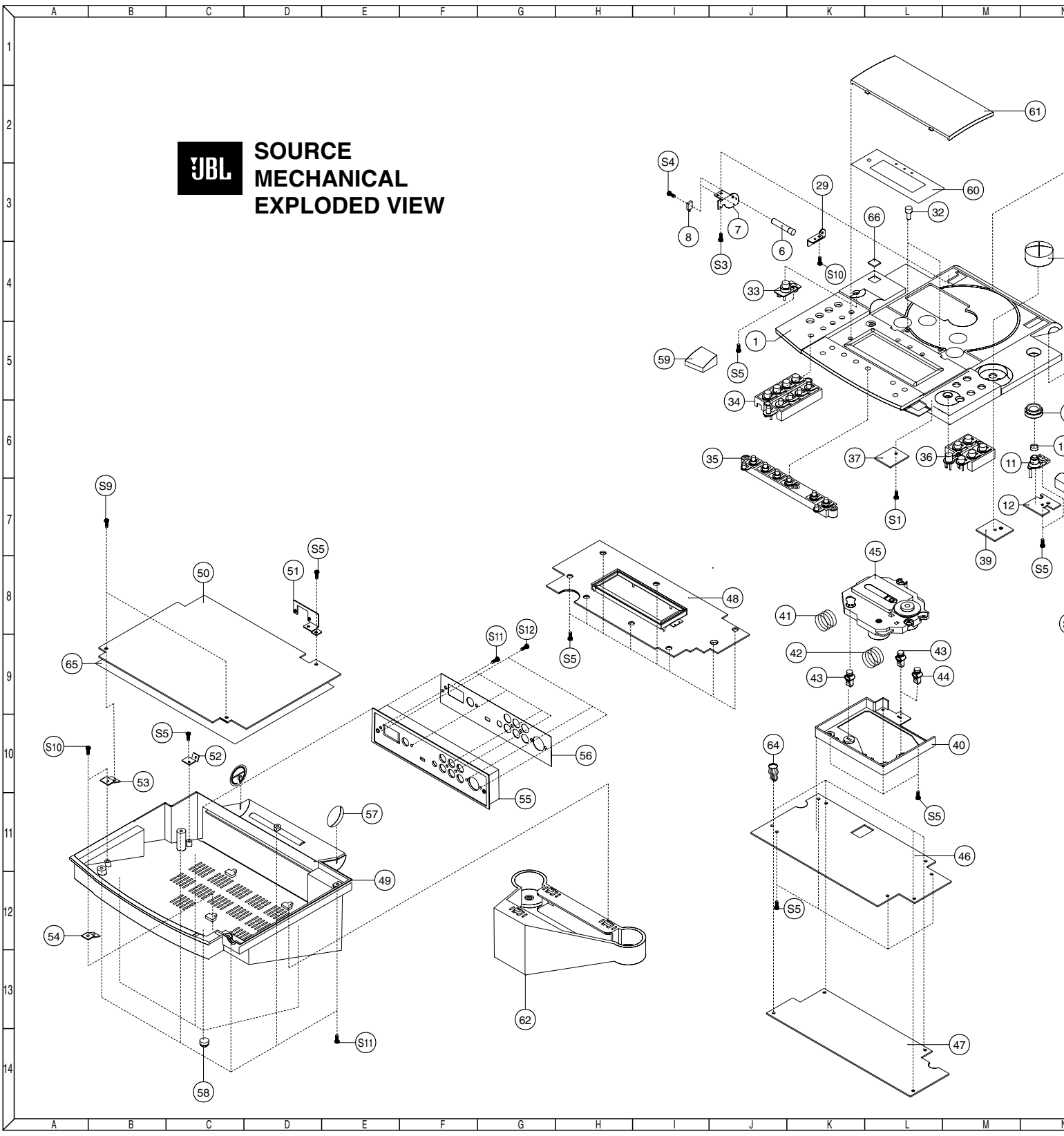
SOURCE BLOCK DIAGRAM



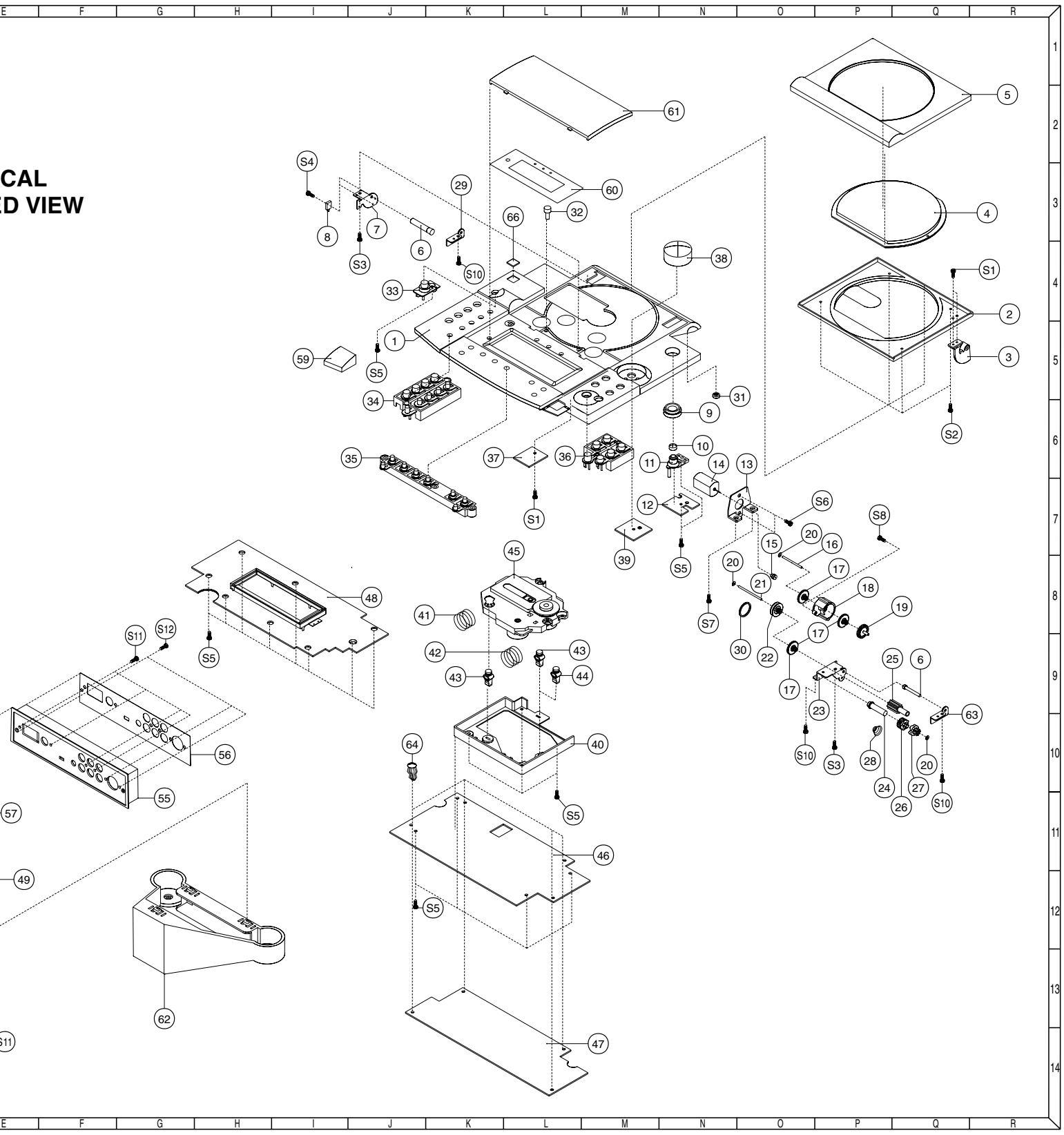
SOURCE MECHANICAL EXPLODED VIEW



SOURCE MECHANICAL EXPLODED VIEW



CAL
D VIEW


E F G H I J K L M N O P Q R
1 2 3 4 5 6 7 8 9 10 11 12 13 14
61
5
60
4
S4
29
66
32
38
S1
8
7
6
S10
S3
33
2
1
59
S5
3
34
31
9
S2
35
37
36
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S6
S8
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56
S10
S3
28
20
24
27
S10
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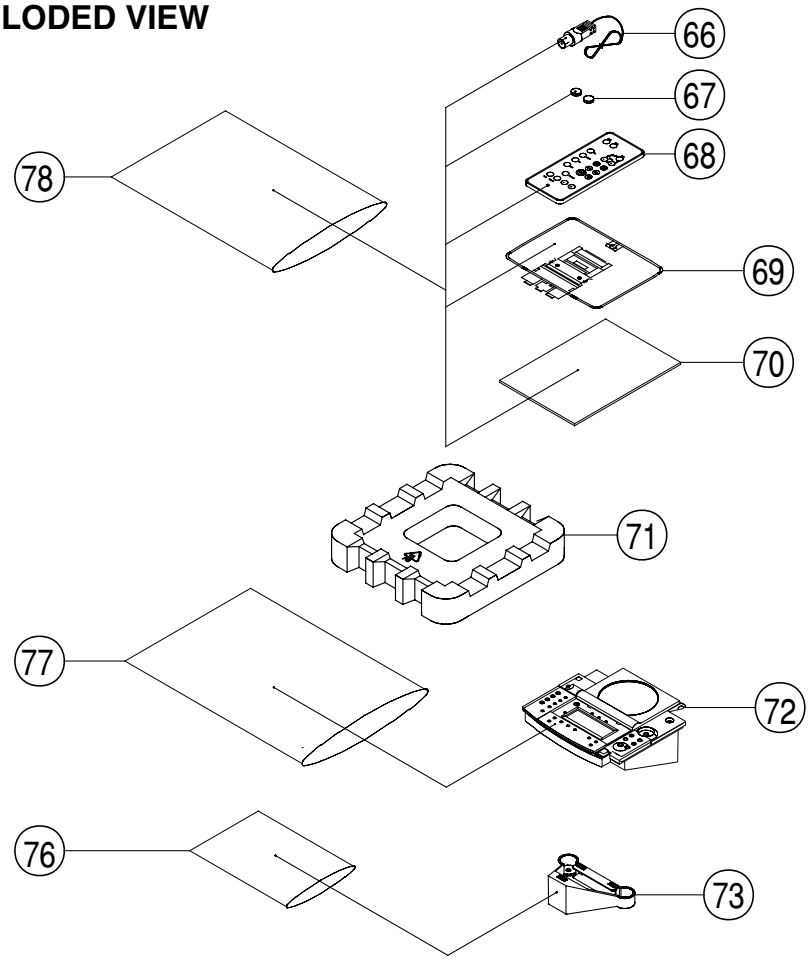
26
57
S5
46
49
S5
62
47
S11
E F G H I J K L M N O P Q R

MECHANICAL PARTS LIST

Ref. #	Part Number	Description	Qty
1	BPT0011-AG1	TOP CABINET	1
2	BPH0018-001	DOOR HOLDER	1
3	BPG1017-001	DOOR LEG	1
4	BPN0051-002	DISC WINDOW	1
5	BPD1016-AG1	CD DOOR	1
6	DSF0002-001	DOOR SHAFT	2
7	GSE0131-001	DOOR BRACKET (LEFT)	1
8	MSV0002-001	LEVER SWITCH	1
9	BPN0052-001	POWER LENS	1
10	BPC0015-001	KNOB CAP	1
11	BPK6020-000	POWER KNOB	1
12	APE0153-031	POWER LED PCB ASSEMBLY	1
13	GSE0130-001	MOTOR BRACKET 1	1
14	FMD0004-001	MOTOR	1
15	BPG1029-001	GEAR F	1
16	DSF0001-001	SHAFT GEAR 2	1
17	BPG1027-001	GEAR D	3
18	BPH0027-001	HOLDER (GEAR)	1
19	BPG1026-001	GEAR C	1
20	HWC4016-302	WASHER OD4.0xID1.6xT0.2 mm MYLAR	3
21	DSF0005-001	SHAFT GEAR 1	1
22	BPG1028-001	GEAR E	1
23	GSE0130-001	MOTOR BRACKET	1
24	DSF0003-001	STUD (GEAR)	1
25	BPG1030-001	GEAR G	1
26	BPG1025-001	GEAR B	1
27	BPG1024-001	GEAR A	1
28	DSU0018-002	SPRING GEAR 800g	1
29	GSE0129-001	DOOR BRKT RIGHT	1
30	BRW0001-001	MOTOR BELT	1
31	DSF0006-001	INSERT	2
32	BRF0012-001	DOOR CUSHION	2
33	BPK4019-000	OPEN/CLOSE KNOB	1
34	BPK2032-000	AM/FM KNOB	1
35	BPK2033-000	FUNCTION. KNOB	1
36	BPK1046-001	SKIP KNOB	1
37	APE0151-021	PHONE JACK PCB ASSEMBLY	1
38	BPK5030-AG0	VOLUME KNOB	1
39	APE0152-021	VR PCB ASSEMBLY	1
40	BPH0021-001	CD HOLDER	1
41	DSU0016-001	CD SPRING LEFT	1
42	DSU0015-001	CD SPRING RIGHT	1
43	BRF0009-001	CD CUSHION WHITE	2
44	BRF0009-002	CD CUSHION BLACK	1
45	WCD0010-001	CD PLAYER CD93V4BF	1
46	APE0152-011	CD DECODER PCB ASSEMBLY	1
47	APE0154-001	PRO-LOGIC PCB ASSEMBLY	1
48	APE0151-011	CONTROL PCB ASSEMBLY	1
49	BPB0010-AGI	BOTTOM CAB	1
50	APE0153-001	MAIN PCB ASSEMBLY	1
51	GSE0135-001	MAIN BRACKET BACK RIGHT	1
52	GSE0136-001	MAIN BRACKET BACK LEFT	1
53	GSE0133-001	MAIN BRACKET FRONT LEFT	1
54	GSE0134-001	MAIN BRACKET FRONT RIGHT	1
55	BPH0020-AG0	JACK PLATE	1
56	BPN0032-001 BPN0032-002	NAME PLATE FOR ESC550 NAME PLATE FOR ESC350	1 1
57	BPC0012-001	CABINET CAP	2
58	BRF0008-001	FOOT	4
59	BPN0054-001	SENSOR WINDOW	1
60	BNP0032-001	DISPLAY SHEET	1
61	BPN0053-002	DISPLAY WINDOW	1
62	BPH0019-AG0	WALL BRACKET	1
63	GSE0143-001	BRACKET DOOR 1	1
64	DSS0010-001	SPACER SUPPORT	4
65	GTN0026-001	SHIELD PLATE MAIN PCB TO BOTTOM CABINET	1
66	CLJ0007-001	JBL LOGO PLATE	1
S1	H101501-105	SCREW T2.6xL5.0mm TAPPING HEAD PHONE TO TOP	3
S2	H101508-306	SCREW T2.6xL6.0 mm FLAT HEAD DOOR TO HOLDER	4
S3	H060301-104	SCREW M3. 0xL4 .0xP0. 5 mm NICKEL DOOR BRACKET	2
S4	H060001-106	SCREW M1.7xL6.0 mm NICKEL SLIDE SW-2	2
S5	H101001-110	"SCREW T3.0xL10.0 mm NICKEL AM/FM KNOB TO TOP-2 BRKT TO BOTTOM-2, FUNCTION KNOB TO TOP-3 SKIP KNOB TO TOP-2, FUNCTION PCB TO TOP-1, CD PCB TO TOP-4, OPEN/CLOSE KNOB TO TOP-1, CD HOLDER TO TOP-4, POWER KNOB TO TOP-1, POWER PCB-1"	21
S6	H060101-304	SCREW M2.0xP0.4xL4.0 mm' BLACK	2
S7	H101501-508	SCREW T2.6xP1.058xL8.0 mm PAN HEAD ZINC MOTOR BRACKET TO TOP	2
S8	H060201-116	SCREW M2.6xP0.45xL16.0 mm NICKEL MOTOR CASE	2
S9	H100301-306	SCREW TAPPING 3.0 x 6 BLACK MAIN PCB TO BRACKET	2
S10	H101001-108	"SCREW T3.0x1.27P-2RHxL8 mm NICKEL (PAN HEAD) DOOR BRACKET TO TOP-3, BRACKET TO BOTTOM-2	5
S11	H101001-310	"SCREW T3.0xL10.0 mm PAN HEAD BLACK TOP TO BOTTOM-5, JACK TO HOLDER-4"	9
S12	H120301-308	SCREW M3x0.5Px8 mm BLACK DIN JACK TO HOLDER-3	3

SOURCE PACKING EXPLODED VIEW

SOURCE
PACKING EXPLODED VIEW



Ref.#	Part Number	Description	Qty
66	VTA9300-012	F Plug Antenna	1
67	FBL0030-001	Lithium Battery	1
68	WIR0020-432	Remote Assembly	1
69	VTA9300-009	Loop Antenna	1
70	332358-001	ESC550 Owner's Manual	1
	YOM0188-001	ESC350 Owner's Manual	1
71	ITF0102-001	End Cap Top	1
72		SOURCE	1
73	BPH0019-AG0	Wall Bracket	1
74	ITF0101-001	End Cap Bottom	1
75	ICC0104-001	Gift Box	1
76	IVP0001-046	Poly Bag L290xW200mm	1
77	IVP0001-045	Poly Bag L350xW350mm	1
78	IVP0001-047	Poly Bag L70xW50mm	1

NOTE: THIS PACKAGE IS PART OF THE ESC350 AND ESC550 SYSTEM PACKAGE.

SOURCE ELECTRICAL PART LISTS

APE0151-011 CONTROL PCB

Capacitors

Ref. #	Part Number	Description	Qty
C301	PRD4965-223	DISC .022 uF 50V +80-20% 11 Z5V	1
C913, 951	PRA3952-101	COND ELECT 100 uF 16V 20% MINI SIZE	2
C932	PRA3952-220	COND ELECT 22 uF 16V 20% MINI SIZE	1
C933	PRD3545-101	COND DISC 100 pF 50V 10% Y5P	1
	PRD3545-103	COND DISC 0.01 uF 50V 10% Y5P KIO TO GND	1
C934, C935	PRD3545-104	COND DISC 0.1 uF 50V 10% Y5P	2

Resistors

Ref. #	Part Number	Description	Qty
R301, 315, 365	QAF0650-151	RESISTOR 150 OHM 1/6W 5% CF	3
R302, 321	QAF0650-331	RESISTOR 330 OHM 1/6W 5% CF	2
R303, 304, 322, 323	QAF0650-391	RESISTOR 390 OHM 1/6W 5% CF	4
R305, 324	QAF0650-561	RESISTOR 560 OHM 1/6W 5% CF	2
R306, 325	QAF0650-681	RESISTOR 680 OHM 1/6W 5% CF	2
R307, 326	QAF0650-751	RESISTOR 750 OHM 1/6W 5% CF	2
R308, 327	QAF0650-821	RESISTOR 820 OHM 1/6W 5% CF	2
R309, 328	QAF0650-122	RESISTOR 1.2K OHM 1/6W 5% CF	2
R310, 329	QAF0650-152	RESISTOR 1.5K OHM 1/6W 5% CF	2
R311	QAF0650-202	RESISTOR 2K OHM 1/6W 5% CF	1
R312	QAF0650-302	RESISTOR 3K OHM 1/6W 5% CF	1
R313	QAF0650-472	RESISTOR 4.7K OHM 1/6W 5% CF	1
R314	QAF0650-822	RESISTOR 8.2K OHM 1/6W 5% CF	1
R317, 363	QAF0650-222	RESISTOR 2.2K OHM 1/6W 5% CF	2
R318, 337, 338	QAF0650-473	RESISTOR 47K OHM 1/6W 5% CF	3
R346, 347, 348, 349	QAF0650-471	RESISTOR 470 OHM 1/6W 5% CF	4
R356-360, 361, 366, 379, 380	QAF0650-103	RESISTOR 10K OHM 1/6W 5% CF	9
R364	QAF0450-249	RESISTOR 2.4 OHM 1/4W 5% CF	1
R362	QAF0450-470	RESISTOR 47 OHM 1/4W 5% CF	1
R919	QAF0650-101	RESISTOR 100 OHM 1/6W 5% CF	1
R920	QAF0650-104	RESISTOR 100K OHM 1/6W 5% CF	1
R921	QAF0650-564	RESISTOR 560K OHM 1/6W 5%CF	1
R922, 923, 924	QAF0650-102	RESISTOR 1K OHM 1/6W 5% CF	3
R951	QAF0650-100	RESISTOR 10 OHM 1/6W 5% CF	1

Diode

Ref. #	Part Number	Description	Qty
D915-917	RAD4148-001	DIODE SW 1N4148	3
ZD905	RAZ0859-066	DIODE ZENR 4.4-4.6V .5W HITACHI	1
ZD906	RAZ0859-071	DIODE ZENR 6.0-6.3V .5W HITACHI HZ6C-2	1

Transistors

Ref. #	Part Number	Description	Qty
Q301, 302, 306, 307, 308, 309, 310, 311, 312	RAN0945-001	XISTR NPN 2SC945P NEC	9
Q313	RHN0882-001	XISTR NPN 2SD882P	1

Integrated Circuit

Ref. #	Part Number	Description	Qty
IC904	RCI5824-001	IC 64 PIN LC75824E SANYO 204 SEG LCD DRIVER	1

Miscellaneous

Ref. #	Part Number	Description	Qty
DP201	KLD0020-001	DISPLAY LC CT-100P-AT PICVUE	1
LD306-309	BPH0024-001	LED HOLDER CU-100	4
LP301	KDG0050-001	LED ARRAY GREEN 50 LED 108x39x6 mm	1
LD306-309	KER0205-001	LED 2DIA x 5DIA; 5.6DIA	4
JK501	CJM9380-035	PHONE JACK JYE TAI JY-3535 3.5 DIA	1
RB702	4999A-301	CON/WIRE 11 COND 120 mm WHITE	1
RB901	4999A-302	CON/WIRE 2 COND 230 mm BLACK	1
RB301	500322008B0	CON/WIRE 2 COND 200 mm	1
RB302	500331508B0	CON/WIRE 3 150 mm BLACK	1
SN951	RHO0638-005	IRT SENSOR PIC-12043TM KODENSHI	1
TA301-315 321-329	MAT2029-001	AI TACT 5W SKHVBE3520 5.0 mm 160 gf	24
	BPH0023-001	HOLDER SENSOR CU-100	1
	GTN0021-001	LCD BRKT CU-100	1

APE0151-021 HEADPHONE PCB

Miscellaneous

Ref. #	Part Number	Description	Qty
C565, 566	PAU3652-102	COND TUBUL 0.001 uF 16V	2
L501, L502	SCC0155-100	CHOKE SMD 10 uH 5% Idc 155 mA	2
L503	SLF0201-011	BEAD FERIT 15 DIAx9.5x6 mm 2500 nH/N	1
RB501	500342408B0	CON/WIRE 4 240 mm BLACK PITCH=2.0 mm	1

APE0152-001 CD DECODER PCB

Capacitors

Ref. #	Part Number	Description	Qty
C801	PRA3951-470	COND ELECT 47 uF 10V 20% MINI SIZE	1
C802, 806, 813, 814, 822, 823, 824, 839, 856, 887, 889	PRD3965-104	COND DISC 0.1 uF 50V +80-20% Y5V/Z5V	11
C805, 807, 818, 820, 827, 830, 831, 835	PRM3737-103	COND MYLAR 0.01 uF 100V 5%	8

Ref. #	Part Number	Description	Qty
C808, 838, 840, 859, 864, 865	PRE3951-101	COND ELECT 100 uF 10V 20%	6
C809, 812	PRM3737-222	COND MYLAR 0.0022 uF 100V 5%	2
C810, 861, 862	PRM3737-102	COND MYLAR 0.001 uF 100V 5%	3
C811, 832	PRM3737-473	COND MYLAR 0.047 uF 100V 5%	2
C815	PRD3545-102	COND DISC 1000 pF 50V 10% Y5P	1
C816, 853, 874, C876	PRA3951-101	COND ELECT 100 uF 10V 20% MINI SIZE	4
C819, 821, 826	PRM3737-333	COND MYLAR 0.033 uF 100V 5%	3
C825	PRE3955-479	COND ELECT 4.7 uF 50V 20%	1
C828	PRE3955-108	COND ELECT 0.1 uF 50V 20%	1
C829, 851, 852	PRA3952-100	COND ELECT 10 uF 16V 20% MINI SIZE	3
C833	PRD3545-221	COND DISC 220 pF 50V 10% 11 Y5P D=5	1
C834, 854	PRE3955-478	COND ELECT 0.47 uF 50V 20%	2
C836, 837	PRD1335-300	COND DISC 30 pF 50V 5% NP0 T.C.	2
C841, 842	PRD1335-820	COND DISC 82 pF 50V 5% NP0	2
C843, 844, 845, 846	PRD1335-390	COND DISC 39 pF 50V 5% NP0	4
C847, 848	PRD3545-331	COND DISC 330 PF 50V 10% Y5P	2
C849, 850	PRD3545-152	COND DISC 1500 pF 50V 10% 11 Y5P D=6	2
C857	PRD3545-201	COND DISC 200 pF 50V 10% Y5P	1
C863, 875	PRM3737-104	COND MYLAR 0.1 uF 100V 5%	2
C873	PRD4965-203	DISC .02 uF 50V +80-20% 11 Z5V D=7	1
C890	PRM3737-152	COND MYLAR 0.0015 uF 100V 5%	1
C891, 892, 894, 895	PRE3952-221	COND ELECT 220 uF 16V 20%	4
C893	PRN1052-470	COND ELECT 47 uF 16V 20% N.P.	1

Resistors

R801, 837, 859, 860, 894, 895	QAF0650-102	RESISTOR 1K OHM 1/6W 5% CF	6
R802, 803, 826, 868, 884, 885	QAF0650-333	RESISTOR 33K OHM 1/6W 5% CF	6
R804	QAF0650-105	RESISTOR 1.0M OHM 1/6W 5% CF	1
R805	QAF0650-153	RESISTOR 15K OHM 1/6W 5% CF	1
R806, 822, 870, 873, 874, 877, 879, 880	QAF0650-473	RESISTOR 47K OHM 1/6W 5% CF	8
R810, 811, 824, 834, 835, 871, 875, 876	QAF0650-104	RESISTOR 100K OHM 1/6W 5% CF	8
R812, 838	QAF0650-222	RESISTOR 2.2K OHM 1/6W 5% CF	2
R813	QAF0650-334	RESISTOR 330K OHM 1/6W 5% CF	1
R814	QAF0650-474	RESISTOR 470K OHM 1/6W 5% CF	1
R815, 878, 893	QAF0650-472	RESISTOR 4.7K OHM 1/6W 5% CF	3
J811, R816, 833, R836, 840, 841, R842, 843, 844, R853, 854, 855, R856, 857, 858, R861, 862, 892	QAF0650-103	RESISTOR 10K OHM 1/6W 5% CF	18
R817	QAF0650-100	RESISTOR 10 OHM 1/6W 5% CF	1
R818	QAF0650-273	RESISTOR 27K OHM 1/6W 5% CF	1
R820	QAF0650-203	RESISTOR 20K OHM 1/6W 5% CF	1
R821	QAF0650-824	RESISTOR 820K OHM 1/6W 5% CF	1
R823	QAF0650-514	RESISTOR 510K OHM 1/6W 5% CF	1
R825	QAF0650-753	RESISTOR 75K OHM 1/6W 5% CF	1
R827, 864, 865	QAF0650-822	RESISTOR 8.2K OHM 1/6W 5% CF	3
R828, 830, 849, 850, 851, 852, 889	QAF0650-223	RESISTOR 22K OHM 1/6W 5% CF	7
R829	QAF0650-124	RESISTOR 120K OHM 1/6W 5% CF	1
R831, 896	QAF0650-562	RESISTOR 5.6K OHM 1/6W 5% CF	2
R832	QAF0650-332	RESISTOR 3.3K OHM 1/6W 5% CF	1
R845, 846, 847, 848	QAF0650-363	RESISTOR 36K OHM 1/6W 5% CF	4
R866, 867	QAF0650-224	RESISTOR 220K OHM 1/6W 5% CF	2
R872	QAF0650-101	RESISTOR 100 OHM 1/6W 5% CF	1
R890, 891	QAF0650-683	RESISTOR 68K OHM 1/6W 5% CF	2
R899	QAF0650-682	RESISTOR 6.8K OHM 1/6W 5% CF	1

Diodes

D801, 802, 803, 804, 809	RAD4148-001	DIODE SW IN4148	5
ZD801	RAZ0859-068	DIODE ZENR 5.0-5.2V .5W HITACHI HZ5C-2	1

Transistors

Q801, 802, 803, 813, 814, 818	RAP0952-001	XISTR PNP 2SA952 NEC	6
Q805, 806	RAN2878-001	XISTR NPN 2SC2878	2
Q807, 811, 812, 815, 816, 817	RAN0945-001	XISTR NPN 2SC945P NEC	6
Q808	RAP0733-001	XISTR PNP 2SA733Q,P NEC	1
Q810	RHP0772-001	XISTR PNP 2SB772P/Q NEC	1
Q819	RAN2001-001	XISTR NPN 2SC2001L NEC	1

Integrated Circuits

IC801	RCI1782-001	IC 48 PIN CXA1782BQ SONY RF AMP + S.S.P	1
IC802	RCI2508-001	IC 80 PIN CXD2508AQ SONY D.S.P + D.A.C	1
IC803	RCI9258-001	IC 28 PIN KA9258D SAMSUNG POWER DRIVE IC	1
IC805, 806	RHI5218-002	IC 8 PIN M5218AL MITSUBISHI OP AMP or 4558L OP-AMP	2
IC809	RHI6218-001	IC 9 PIN BA6218 MOTOR DRIVER IC	1

MISCELLANEOUS

CN801	CCN0122-018	CONNECTOR 18 PIN PD18-1810D P=1.0 mm	1
CN301, 81, 82, 83	CCN7879-022	CONNECTOR J.S.T. 2.0mm PH B2B-PH-K TOP SIZE	4
CN802	CCN7879-036	CONN 90DEG 2 PIN PITCH=2.0mm SIDE ENTRY TYPE	1

Ref. #	Part Number	Description	Qty
	GTN0011-001	HEAT SINK for IC803 1.0(T)x20(L)x20(W)mm TN	1
XL801	JQC6071-338 /U L=5.0 mm	CRYSTAL 33.8688 MHZ	1
L801, 802, 803	SHC7414-100	CHOKE 10	3
RB802	4999A-303	CON/WIRE 9 COND 120 mm PITCH=2.0 mm	1
RB805	4999A-304	CON/WIRE 5 COND 280 mm PITCH=2.0 mm	1
RB804	4999A-305	CON/WIRE 3 COND 380 mm	1
RB806	4999A-306	CON/WIRE 3 COND 250 mm PITCH=2.0 mm	1
TA330	MAT2029-001	AI TACT SW SKHVBE3520 5.0 mm 160 gf	1
P1 TO P1'	5820-110BB	WIRE 26 GA 110 mm BLACK	1
P2-P2'	5820-200BB	WIRE 26 GA 200 mm BLACK	1

APE0152-021 VOLUME PCB

C709, 710	PRD3545-102	COND DISC 1000 pF 50V 10% Y5P	2
RB703	4999A-307	CON/WIRE 3 240 mm PITCH=2.0 mm	1
VR401	MSR1624-202	R-ENCODER EC16B24202 ALPS 16 mm WITH DETENT	1

APE0153-001 MAIN PCB

Capacitors

C001, 002, 006, 007, 008, 010, 103, 106, 110, 113, 125, 126, 128, 152, 157, 171, 192, 193, 563, 564, 708, 908, 910	PRD4965-223	COND DISC .022 uF 50V +80-20% II Z5V	23
C003, 107, 153, 154	PRD4965-103	COND DISC .01 uF 50V +80-20% II Z5V D=6	4
C004	PRD1335-100	COND DISC 10 pF 50V 5% NP0	1
C005	PRD3545-222	COND DISC 2200 pF 50V 10% Y5P	1
C009, 191, 194, 712, 714, 715, 719, 720	PAU3545-101	COND TUBUL 100 pF 50V 10% B(Y5P)	8
C011	PRD1395-509	COND DISC 5 pF 50V +-0.5pF NP0 D=5	1
C101, 546, 547, 911, 912	PRD3965-104	COND DISC 0.1 uF 50V +80-20% Y5V/Z5V	5
C102	PRP3935-561	COND POLY 560 pF 50V 5%	1
C108, 111, 170, 562	PRD3545-221	COND DISC 220 pF 50V 10% 11 Y5P D=5	4
C109	PRD3545-473	COND DISC 0.047 uF 50V 10% Y5P	1
C112, 117, 127, 167, 429, 430, 473, 474	PRA3952-100	COND ELECT 10 uF 16V 20% MINI SIZE	8
C114, 115	PRA3955-479	COND ELECT 4.7 uF 50V 20% MINI SIZE	2
C118	PRA3955-478	COND ELECT 0.47 uF 50V 20% MINI SIZE	1
C119	PRM3737-153	COND MYLAR 0.015 uF 100V 5%	1
C120, 163, 477	PRA3952-220	COND ELECT 22 uF 16V 20% MINI SIZE	3
C121, 162	PRM3737-473	COND MYLAR 0.047 uF 100V 5%	2
C129, 132, 165, 168, 169, 175, 176, 426, 431, 461, 462, 463, 464, 465, 466, 531, 532, 550, 551, 704	PRA3955-109	COND ELECT 1 uF 50V 20% MINI SIZE	20
C130, 131, 161	PRD3545-102	DISC 1000 pF 50V 10% Y5P	3
C151, 158, 428, 542, 543	PRA3951-101	COND ELECT 100 uF 10V 20% MINI SIZE	5
C155, 164, 489, 907	PRA3955-339	COND ELECT 3.3 uF 50V 20% MINI SIZE	4
C156, 189, 190, 535, 536, 548, 549, 554, 555, 560, 561	PRD3545-101	COND DISC 100 pF 50V 10% Y5P	11
C159, 160	PRD1335-300	COND DISC 30 pF 50V 5% NP0 T.C.	2
C173, 174	PRD3545-681	COND DISC 680 pF 50V 10% Y5P	2
C401, 402, 403, 404, 407, 408, 421, 422 478, 479, 480, 481, 488, 533, 534, 552, 553, 705, 706	PRD1335-470	COND DISC 47 pF 50V 5% NP0	19
C420, 423, 424, 427, 539, 540	PRA3952-101	COND ELECT 100 uF 16V 20% MINI SIZE	6
C467, 468, 469, 470	PEP2635-104	COND METAL 0.1 uF 50V 5% MINI SIZE (AI)	4
C472, 903, 904, 913	PRE3952-471	COND ELECT 470 uF 16V 20%	4
C475, 476	PRM3737-272	COND MYLAR 0.0027 uF 100V 5%	2
C482, 483, 484, 485, 486, 487	PRD3545-471	COND DISC 470 pF 50V 10% 11 Y5P D=5	6
C544, 545	PRA3952-470	COND ELECT 47 uF 16V 20% MINI SIZE	2
C702	PHG3950-107	MEMORY 0.1 F 5.5V 20%	1
C707	PRE3951-471	COND ELECT 470 uF 10V 20%	1
C713, 716, 717, 718	PAU3545-470	COND TUBUL 47 pF 50V 10% B(Y5P)	4
C902, 909	PRA3951-221	ELECT 220 uF 10V 20% MINI SIZE	2

Diodes

D101, 102, 103, 104, 152, 403, 404, 405, 406, 501, 502, 503, 701, 702, 703, 704, 705, 706, 707, 709	RAD4148-001	DIODE SW 1N4148	20
VD101, 102	RHT6066-011	DIODE TUNG AM TOSHIBA 1SV149B	2
ZD101, 501, 701	RAZ0859-068	DIODE 5.0-5.2V .5W HITACHI HZ5C-2	3

Ref. #	Part Number	Description	Qty
Resistors			
R001, 005, 117, 126, 181, 182, 576, 577, 578, 579, 715	QAF0650-473	RESISTOR 47K OHM 1/6W 5% CF	11
R002, 101, 102, 130, 141, 161, 171, 175, 176, 405, 406, 409, 410, 429, 430, 435, 436, 463, 464, 533, 534, 537, 538, 543, 544, 554, 555, 559, 561, 909	QAF0650-104	RESISTOR 100K OHM 1/6W 5% CF	30
R003, 004, 006, 009, 012, 103, 106, 155, 706	QAF0650-331	RESISTOR 330 OHM 1/6W 5% CF	9
R007	QAF0650-470	RESISTOR 47 OHM 1/6W 5% CF	1
R008, 109, 191, 192, 541, 542, 551, 560, 563	QAF0650-223	RESISTOR 22K OHM 1/6W 5% CF	9
R013, 014, 111, 115, 125, 127, 131, 132, 140, 193, 196, 197, 198, 422, 423, 479, 574, 575, 707, 708, 721, 722, 723, 724	QAF0650-103	RESISTOR 10K OHM 1/6W 5% CF	24
R104	QAF0650-471	RESISTOR 470 OHM 1/6W 5% CF	1
R105	QAF0650-330	RESISTOR 33 OHM 1/6W 5% CF	1
R108, 128, 150, 152, 153, 158, 159, 183, 189, 190, 401, 402, 403, 404, 407, 408, 415, 416, 421, 425, 426, 458, 459, 468, 469, 545, 546, 548, 549, 564, 565, 566, 567, 568, 569, 719	QAF0650-102	RESISTOR 1K OHM 1/6W 5% CF	36
R113, 195	QAF0650-821	RESISTOR 820 OHM 1/6W 5% CF	2
R116	QAF0650-220	RESISTOR 22 OHM 1/6W 5% CF	1
R129	QAF0650-392	RESISTOR 3.9K OHM 1/6W 5% CF	1
R151	QAF0650-332	RESISTOR 3.3K OHM 1/6W 5% CF	1
R154, 172, 572, 573, 709, 710, 713, 714, 718	QAF0650-472	RESISTOR 4.7K OHM 1/6W 5% CF	9
R160, 427, 428	QAF0650-123	RESISTOR 12K OHM 1/6W 5% CF	3
R177, 178	QAF0650-823	RESISTOR 82K OHM 1/6W 5% CF	2
R179, 180, 531, 532, 552, 553, 582, 583, 720	QAF0650-222	RESISTOR 2.2K OHM 1/6W 5% CF	9
R411, 412, 481	QAF0650-221	RESISTOR 220 OHM 1/6W 5% CF	3
R420, 433, 434, 467, 478, 535, 536	QAF0650-101	RESISTOR 100 OHM 1/6W 5% CF	7
R465, 466	QAF0650-682	RESISTOR 6.8K OHM 1/6W 5% CF	2
R480	QAF0650-151	RESISTOR 150 OHM 1/6W 5% CF	1
R539, 540, 558, 562	QAF0650-122	RESISTOR 1.2K OHM 1/6W 5% CF	4
R550, 580, 581	QAF0650-822	RESISTOR 8.2K OHM 1/6W 5% CF	3
R570, 571	QAF0650-479	RESISTOR 4.7 OHM 1/6W 5% CF	2
R716, 717	QAF0650-273	RESISTOR 27K OHM 1/6W 5% CF	2
R902	QHM1050-159	RESISTOR 1.5 OHM 1W 5% METAL FILM P=12.5 mm	1
R907	QAF0650-100	RESISTOR 10 OHM 1/6W 5% CF	1
RA701, 702, 703, 704	QVP0859-472	RES ARRAY 4.7K OHM 1/8W 5% 9 PIN	4
Fuses			
F902	RAF0508-001	DIODE FUSE 0.8A 50V ROHM ICP-N20	1
F901, 903	RAF0515-001	DIODE FUSE 1.5A 50V ROHM ICP-N38	2
Transistors			
Q001, 002	RAN1675-001	XISTR NPN 2SC1675L NEC	2
Q003, 103, 152, 533, 701, 703	RAP0733-001	XISTR PNP 2SA733Q,P NEC	6
Q004, 102, 104, 105, 150, 151, 153, 702, 704	RAN0945-001	XISTR NPN 2SC945P NEC	9
Q101	RAM0192-001	FET 2SK192A-Y/GR TOSHIBA	1
Q181, 182, 531, 532, 535, 536, 537, 538, 551, 552	RAN2878-001	XISTR NPN 2SC2878	10
Integrated Circuits			
IC101	RHI1266-001	IC 24 PIN LA1266 AM/FM IF	1
IC103	RHI3410-001	IC 16 PIN LA3410 MULTIPLEXER	1
IC151	RHI9216-001	IC 16 PIN TC9216P TOSHIBA PLL WITH PRESCALER	1
IC401	RHI7822-001	IC 30 PIN LC7822N AUDIO SWITCHER	1
IC402, 403, 503, 504	RHI5218-002	IC 8 PIN M5218AL MITSUBISHI OP AMP or 4558L OP-AMP	4
IC405	RCI7313-001	IC 28 PIN TDA7313D STEREO AUDIO PROCESSOR	1
IC505	RHI2822-001	IC 8 PIN TDA2822 POWER AMP	1
IC701	RCI8740-040	IC 64 PIN TMP87M-040 TOSHIBA MICROPROCESSOR	1
IC902	RAI7806-002	IC 3 PIN REGULATOR 6V 100 mA 78L06	1
Miscellaneous			
CN501, 701	CCN7879-024	CONNECTOR J.S.T. 2.0mm PH B4B-PH-K TOP SIZE	2
CN601, 702	CCN7879-031	CONNECTOR J.S.T. 2.0mm PH B11B-PH-K TOP SIZE	2
CN602	CCN7879-030	CONNECTOR J.S.T. 2.0mm PH B10B-PH-K TOP SIZE	1
CN703, 804, 806	CCN7879-023	CONNECTOR J.S.T. 2.0mm PH B3B-PH-K TOP SIZE	3
CN802	CCN7879-029	CONNECTOR J.S.T. 2.0mm PH B9B-PH-K TOP SIZE	1
CN805	CCN7879-025	CONNECTOR J.S.T. 2.0mm PH B5B-PH-K TOP SIZE	1

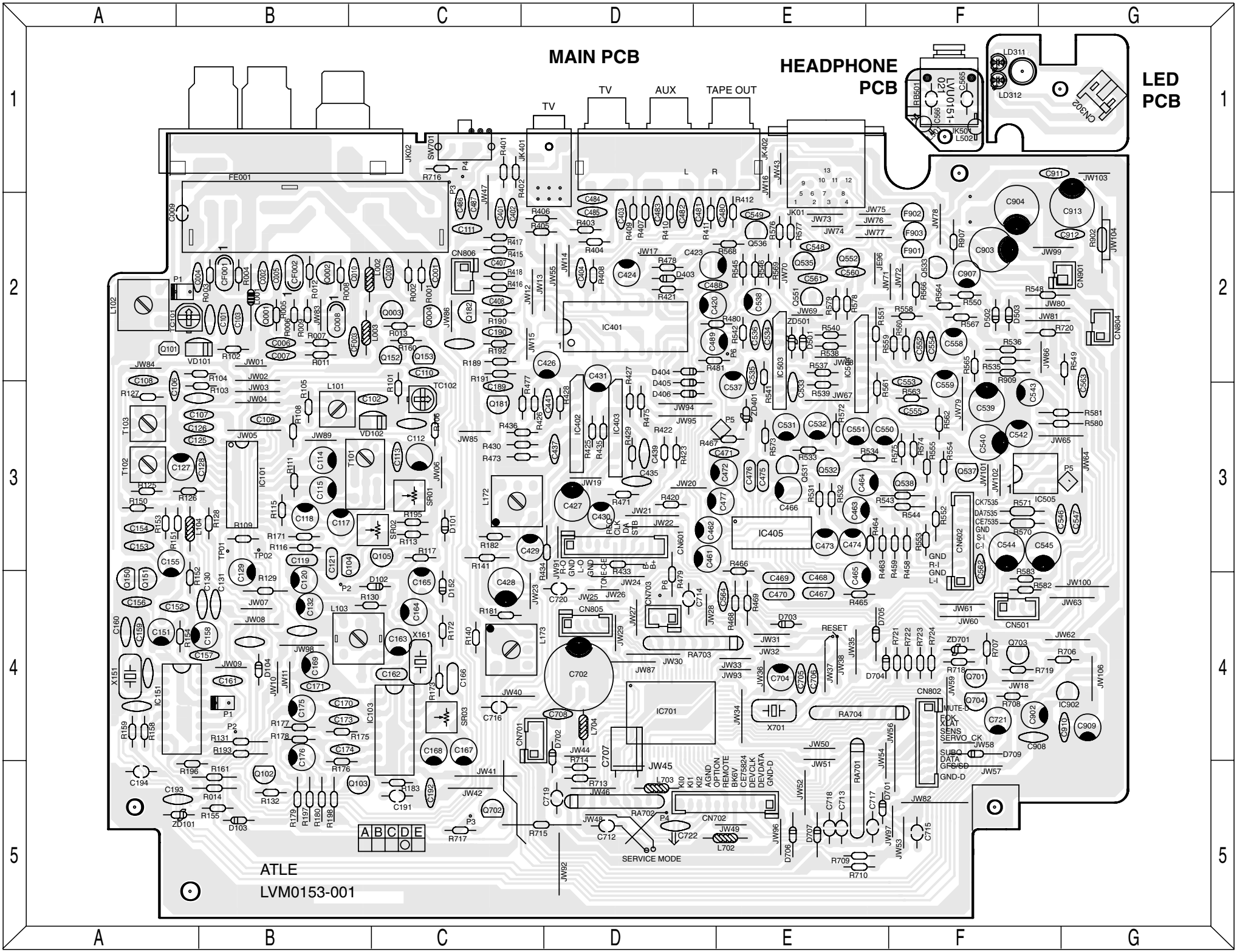
Ref. #	Part Number	Description	Qty
CN901	CCN7879-022	CONNECTOR J.S.T. 2.0mm PH B2B-PH-K TOP SIZE	1
CF001	JFR7047-011	CER FILTER MURATA .7MJ 10.7MHZ	1
CF002, 003	JFR7047-007	CER FILTER MURATA .7MS2-A10.7MHZ	2
JK02	CJA0005-001	ANT JACK FM/AM ANT JACK FM SCREW TYPE INPUT	1
JK01	CJD0001-001	DIN JACK TCS5003-01-4151 13 PIN	1
JK401	CJM9380-034	PHONE JACK TAI JY-3531 3.5 DIA BLACK	1
JK402	CJR6506-001	RCA JACK 3 INPUT TYPE RED WHITE COLOR	1
X151	JQC6071-450	CRYSTAL 4.5000 MHZ /U L=5.0mm	1
X701	JQC6071-800	CRYSTAL 8.0 MHZ L=5.0 mm	1
X161	JRN6078-010	RESONATOR MURATA 456F18	1
CN302	CCN7879-037	CONN 90DEG 3 PIN PITCH=2.0 mm SIDE ENTRY TYPE	1
EF01	WTP0001-001	TUNER PACK MITSUMI FE415-G11A	1
L001, 002, 003, 104, 702, 703, 704	SHC7414-100	CHOKE 10 uH	7
L101	SHV2020-001	OSC AM 108uH (796 KHz)	1
L102	SHV0491-001	ANT OSC AM SUMIDA SM-10C	1
L103	SHV1492-001	FILTER SUMIDA KM-10DF	1
L172, 173	SHV1492-002	FILTER SUMIDA TWS-358-760 19 KHz NOTCH FILTER	2
P-P1'	CC128JCJJCJ	SHLD CABLE 120MM GRAY	1
P2-P2'	5820-060BB	WIRE 26 GA 60 mm BLACK	1
P3-P3'	5820-174BB	WIRE 26 GA 170 mm YELLOW	1
P4-P4'	5820-180BB	WIRE 26 GA 180 mm BLACK	1
P5-P5'	5820-103BB	WIRE 26 GA 100 mm ORANGE	1
P6-P6'	5820-082BB	WIRE 26 GA 80 mm RED	1
SR01, 02	MRT0103-003	TRIMR 10KB 30% P=5x5mm RH0611CI4J	2
SR03	MRT0503-003	CNTL TRIMR 50KB 30% P=5x5 mm RH0611C54J	1
SW701	MSS9477-029	SW SLIDE SK-12E12-G7 DC 50V 0.5A	1
T101	SHI9724-056	AM IFT CF-0816 SUMIDA	1
T102	SHI9725-057	FM IFT 10.7MHz TWS-358-637 QU7 SUMIDA	1
T103	SHI9725-058	FM IFT 10.7MHz TWS-358-636 QU7 SUMIDA	1
TC101	MCT0510-006	COND TRIM 3 - 10 PF NP0	1
TC102	MCT0520-005	TRIM 4.2 - 20 PF N450	1

APE151-031 LED PCB

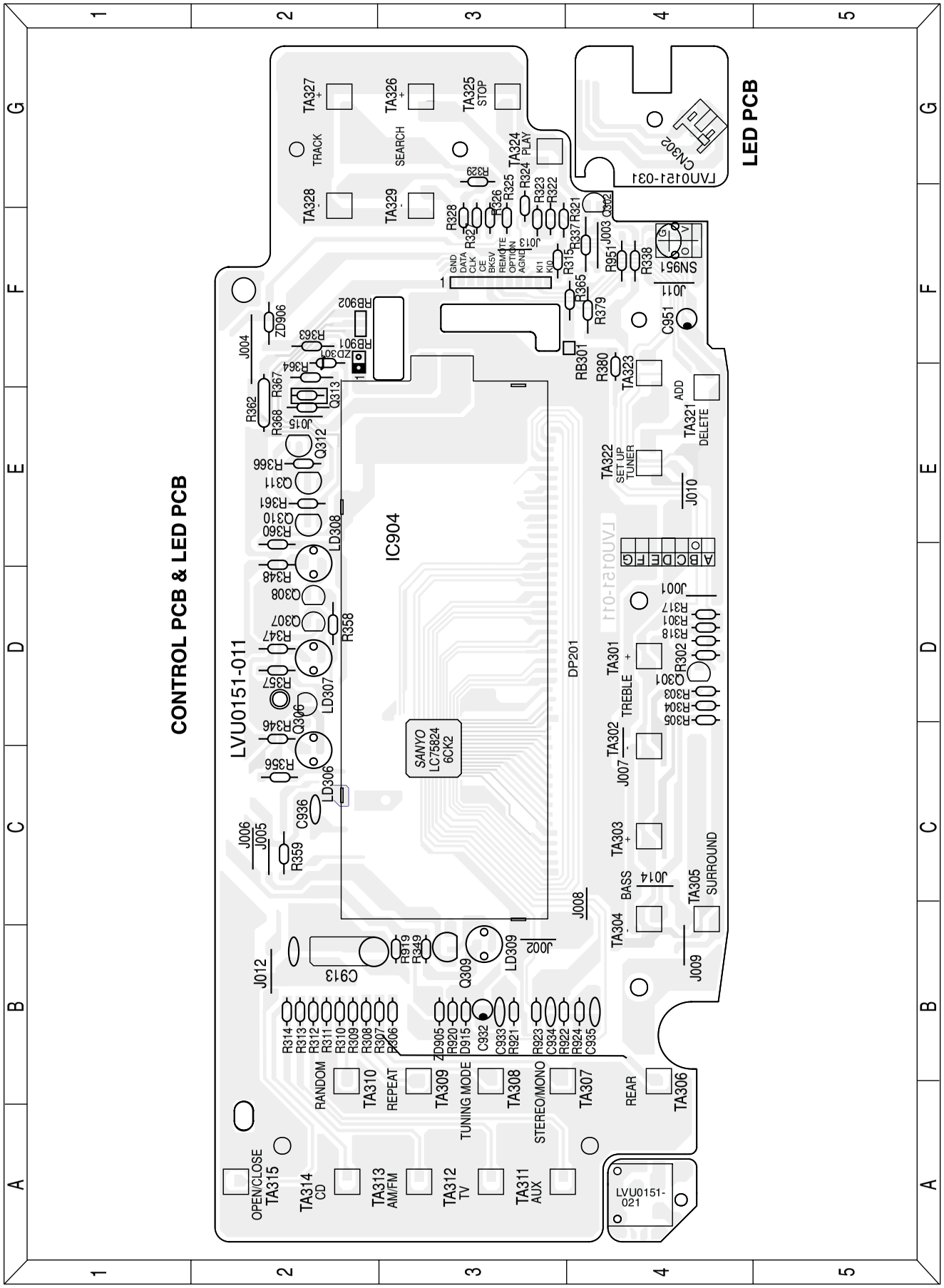
LD311, 312	KEM0002-002	LED 3 LED TWO COLORS GREEN/AMBER CHANGE	2

Ref. #	Part Number	Description	Qty
APE0154-001	**PRO-LOGIC PCB**		
Capacitors			
C501, 502, 507, 509, 662	PRA3955-109	COND ELECT 1 uF 50V 20% MINI SIZE	5
C503, 504, 505, 506, 611, 612, 631, 636, 637, 672, 678, 679, 687, 688	PRA3955-479	COND ELECT 4.7 uF 50V 20% MINI SIZE	14
C508, 512, 515, 664, 691, 692	PRA3952-470	COND ELECT 47 uF 16V 20% MINI SIZE	6
C510, 511	PRD3545-221	COND DISC 220 pF 50V 10% II Y5P D=5	2
C513	PRD3545-222	COND DISC 2200 pF 50V 10% Y5P	1
C601, 602	PRD3545-681	COND DISC 680 pF 50V 10% Y5P	2
C603, 604, 626	PDP2635-473	COND METAL 0.047 uF 50V 5% MINI SIZE	3
C605, 615	PRA3951-220	COND ELECT 22 uF 10V 20% MINI SIZE	2
C606, 639, 640, 641, 642, 645, 646, 657, 658, 665	PEP2635-104	COND METAL 0.1 uF 50V 5% MINI SIZE (AI)	10
C609, 610, 613	PRA3951-100	COND ELECT 10 uF 10V 20% MINI SIZE	3
C614, 627	PRM3737-472	COND MYLAR .0047 uF 100V 5%	2
C616, 618, 621, 622, 623	PRA3952-100	COND ELECT 10 uF 16V 20% MINI SIZE	5
C617, 663, 673	PRD4965-223	COND DISC .022 uF 50V +80-20% II Z5V	3
C620, 650, 670, 680, 681, 689, 690, 693	PRA3952-101	COND ELECT 100 uF 16V 20% MINI SIZE	8
C624	PRM3737-153	COND MYLAR 0.015 uF 100V 5%	1
C625	PRA3951-221	ELECT 220 uF 10V 20% MINI SIZE	1
C628	PRD3545-471	COND DISC 470 pF 50V 10% II Y5P D=5	1
C629	PDP2635-684	COND METAL 0.68 uF 50V 5% MINI SIZE	1
C630, 647	PRD3545-562	DISC 5600 pF 50V 10% Y5P	2
C632	PRM3737-103	COND MYLAR 0.01 uF 100V 5%	1
C633, 634, 635, 638	PEP2635-224	COND METAL 0.22 uF 50V 5% MINI SIZE (AI)	4
C643, 644	PDP2635-223	COND METAL 0.022 uF 50V 5% MINI SIZE	2
C648, 661	PRD3545-561	COND DISC 560 pF 50V 10% II Y5P D=5	2
C649	PRD3965-104	COND DISC 0.1 uF 50V +80-20% Y5V/Z5V	1
C651, 652	PRD1335-300	COND DISC 30 pF 50V 5% NP0 T.C.	2
C654	PRD1335-470	COND DISC 47 pF 50V 5% NP0	1
C655, 659	PDP2645-683	COND METAL 0.068 uF 50V 10% MINI SIZE	2
C656	PRA3951-470	COND ELECT 47 uF 10V 20% MINI SIZE	1
C660	PRM3737-562	COND MYLAR .0056 uF 100V 5%	1

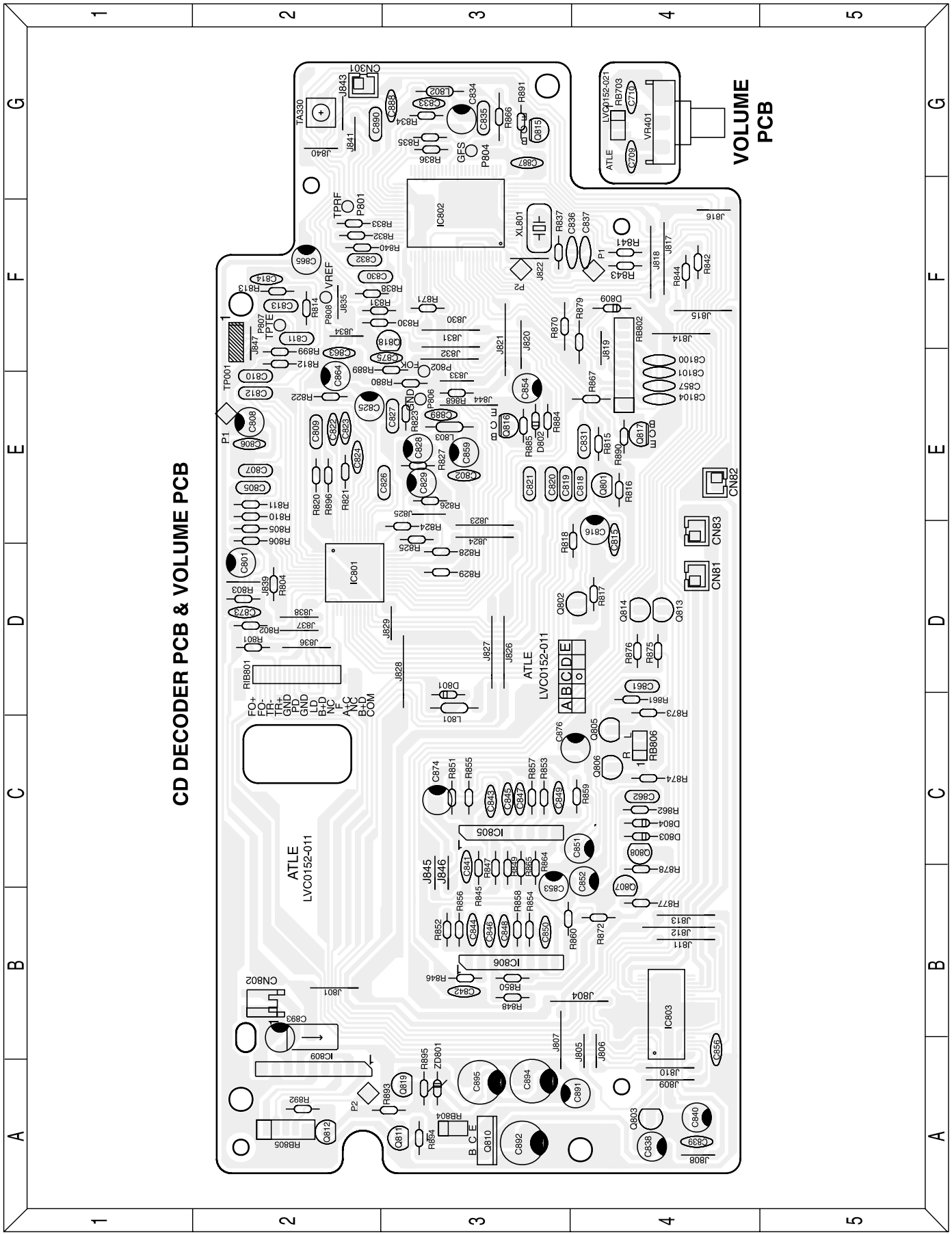
Ref. #	Part Number	Description	Qty
C671	PRD3965-224	DISC 0.22 uF 50V +80-20% Y5V/Z5V	1
Diodes			
D601, 602, 604	RAD4148-001	DIODE SW 1N4148	3
ZD602	RAZ0859-064	DIODE ZENR 3.8-4.0V .5W HITACHI HZ4B-2	1
ZD601	RAZ0859-070	DIODE ZENR 5.6-5.9V .5W HITACHI HZ6B-2	1
Resistors			
R501, 502, 510, 619, 637, 638, 689, 690	QAF0650-102	RESISTOR 1K OHM 1/6W 5% CF	8
R503, 504, 654, 655, 665, 666	QAF0650-224	RESISTOR 220K OHM 1/6W 5% CF	6
R505, 506, 507, 617, 623, 662, 663, 673, 674	QAF0650-101	RESISTOR 100 OHM 1/6W 5% CF	9
R508, 509, 620, 632, 633, 641, 681, 691, 692	QAF0650-103	RESISTOR 10K OHM 1/6W 5% CF	9
R512	QAF0650-471	RESISTOR 470 OHM 1/6W 5% CF	1
R601, 603, 640, 649	QAF0650-153	RESISTOR 15K OHM 1/6W 5% CF	4
R602, 605	QAF0650-473	RESISTOR 47K OHM 1/6W 5% CF	2
R604, 625	QAF0650-752	RESISTOR 7.5K OHM 1/6W 5% CF	2
R606	QAF0650-475	RESISTOR 4.7M OHM 1/6W 5% CF	1
R607, 608, 616	QAF0650-472	RESISTOR 4.7K OHM 1/6W 5% CF	3
R609, 610, 614, 615, 650, 651, 652, 653	QAF0650-223	RESISTOR 22K OHM 1/6W 5% CF	8
R613, 618, 631, 660, 661, 671, 672	QAF0650-104	RESISTOR 100K OHM 1/6W 5% CF	7
R621	QAF0650-474	RESISTOR 470K OHM 1/6W 5% CF	1
R629	QAF0650-560	RESISTOR 56 OHM 1/6W 5% CF	1
R634	QAF0650-300	RESISTOR 30 OHM 1/6W 5% CF	1
R635	QAF0650-105	RESISTOR 1.0M OHM 1/6W 5% CF	1
R636, 677, 678, 679, 680	QAF0650-222	RESISTOR 2.2K OHM 1/6W 5% CF	5
R642	QAF0650-183	RESISTOR 18K OHM 1/6W 5% CF	1
R643	QAF0650-272	RESISTOR 2.7K OHM 1/6W 5% CF	1
R644	QAF0650-683	RESISTOR 68K OHM 1/6W 5% CF	1
R645, 647, 648	QAF0650-822	RESISTOR 8.2K OHM 1/6W 5% CF	3
R646	QAF0650-334	RESISTOR 330K OHM 1/6W 5% CF	1
R675	QAF0450-271	RESISTOR 270 OHM 1/4W 5%	1
R676	QAF0650-100	RESISTOR 10 OHM 1/6W 5% CF	1
Transistors			
Q601, 603, 604	RAN0945-001	XISTR NPN 2SC945P NEC	3
Q602	RAP0733-001	XISTR PNP 2SA733Q,P NEC	1
Integrated Circuits			
IC501, 605, 606	RHI5218-002	IC 8 PIN M5218AL MITSUBISHI OP AMP 8 PIN L TYPE	3
IC502	RHI7535-011	IC 22 PM LC7535 VOLUME CONTROL	1
IC601	RCI2177-001	IC 64 PIN NJM2177AFB3 DOLBY DECODER	1
IC602	RHI4094-001	IC 16 PIN TC4094BP TOSHIBA 8 BIT SHIFT REGISTER	1
IC603	RCI6583-001	IC 24 PIN M65830BFP DIGITAL DELAY	1
IC604	RHI4052-001	IC 16 PIN TC4052BP DIP 4 CH MULTIPLEXER	1
Miscellaneous			
P1-P1'	5820-104BB	WIRE 26 GA 100 mm YELLOW	1
RB602	4999A-308	CON/WIRE 10 COND 200 mm PITCH=2.0 mm	1
RB601	4999A-309	CON/WIRE 11 COND 100 mm PITCH=2.0 mm	1
VR601	MRT0503-003	TRIMR 50KB 30% P=5x5 mm RHO611C54J	1
XL601	JRN6078-200	RESONATOR 2 MHz	1


MAIN PCB
HEADPHONE PCB
LED PCB
TV
AUX
TAPE OUT
ATLE
LVM0153-001
SERVICE MODE

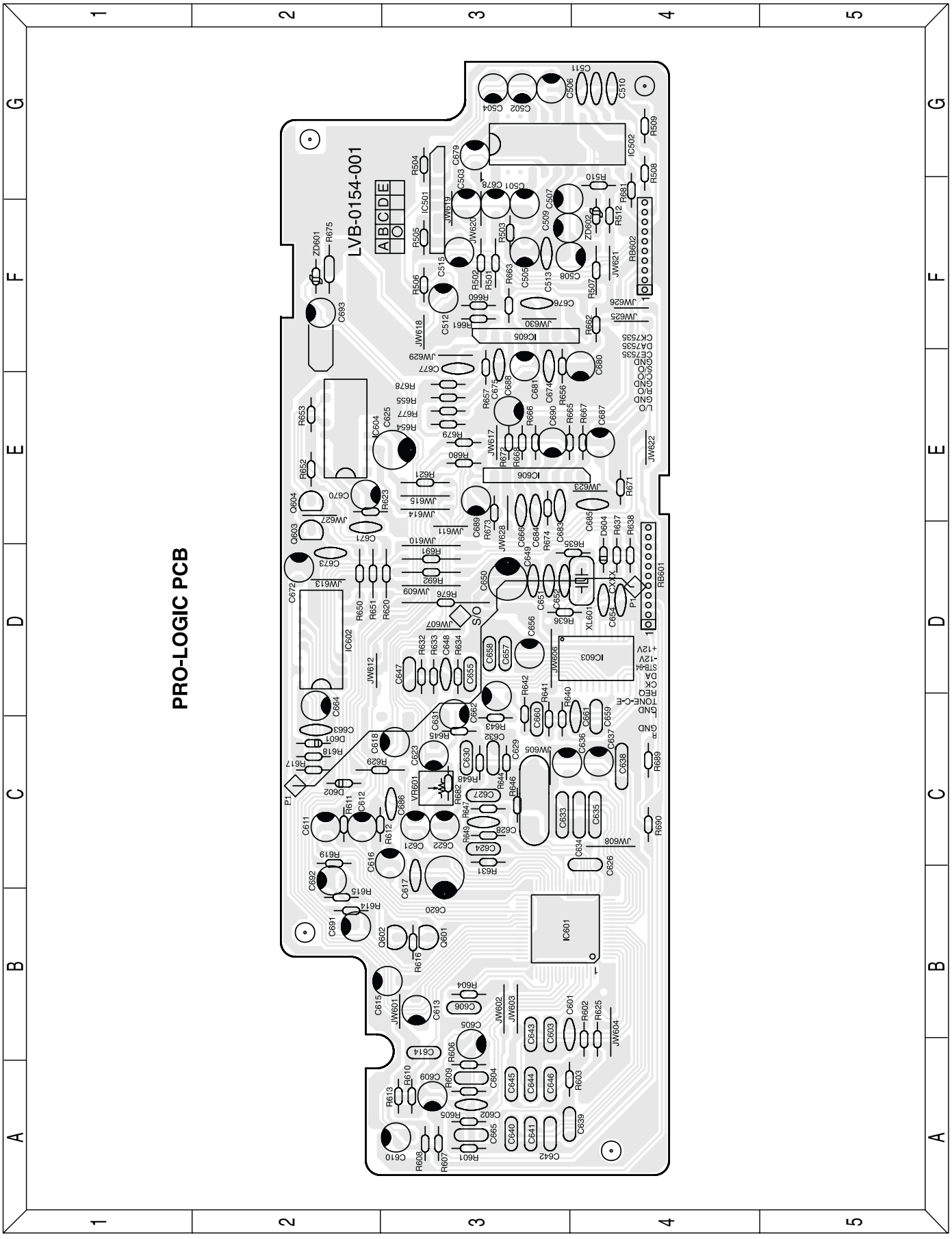
SOURCE CONTROL PCB, LED PCB



SOURCE CD DECODER PCB, VOLUME PCB

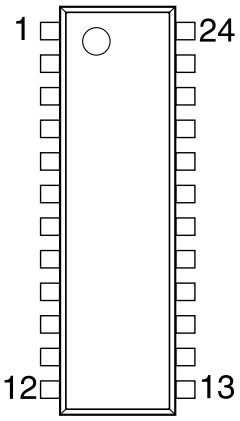


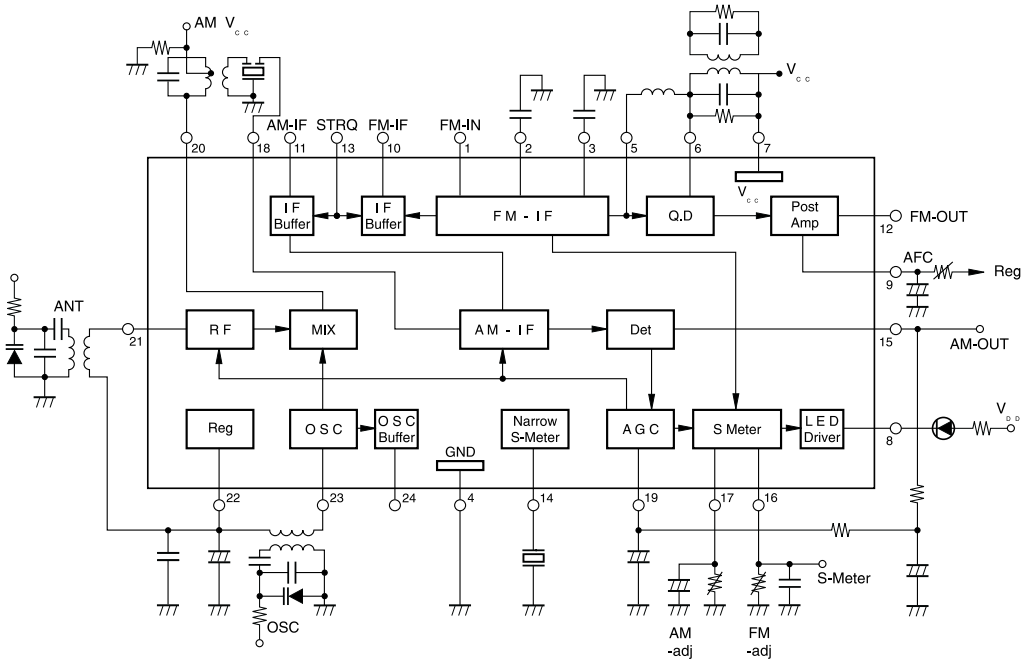
SOURCE PRO-LOGIC PCB



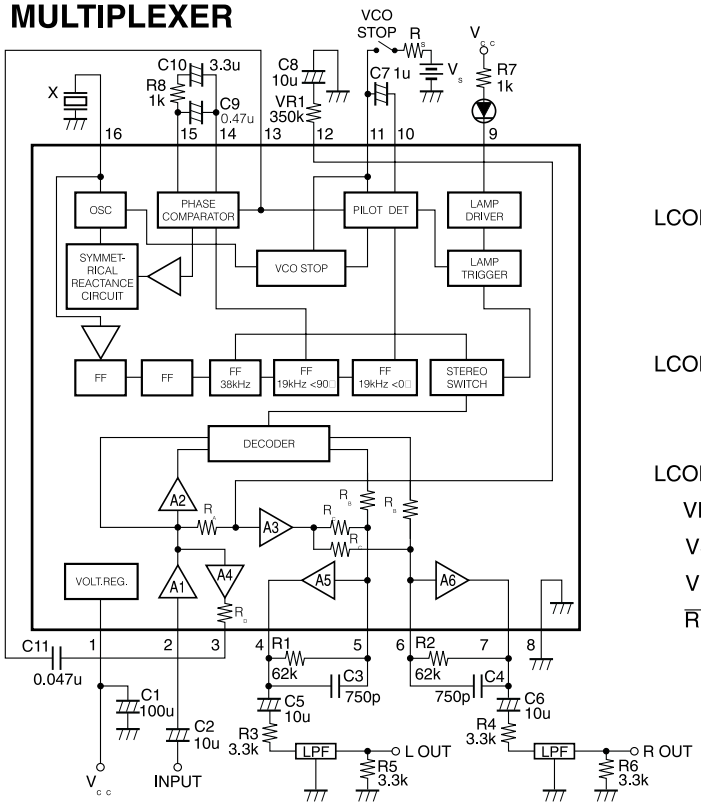
SOURCE INTEGRATED CIRCUIT DIAGRAMS

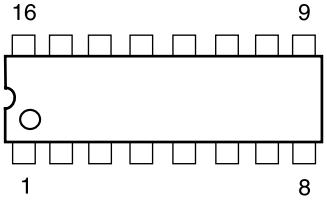
IC101 - LA1266
AM/FM IF



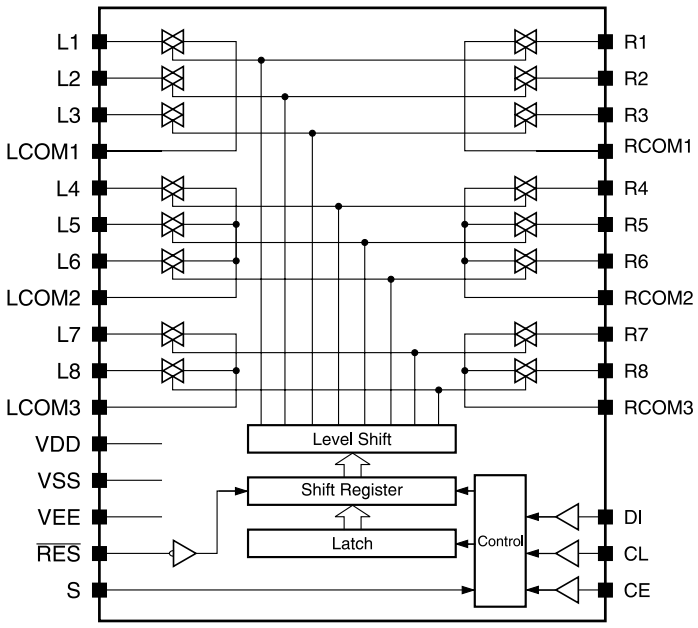


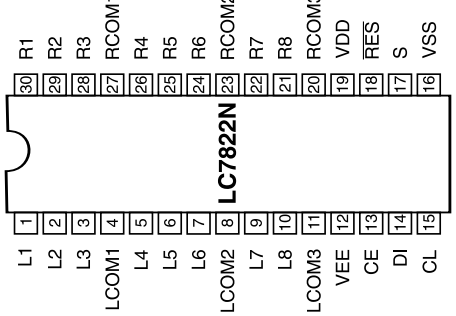
IC103 - LA3410
MULTIPLEXER





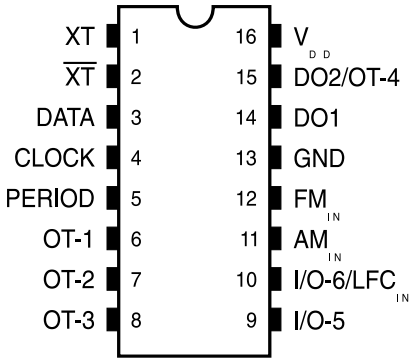
IC401 - LC7822N AUDIO SWITCHER

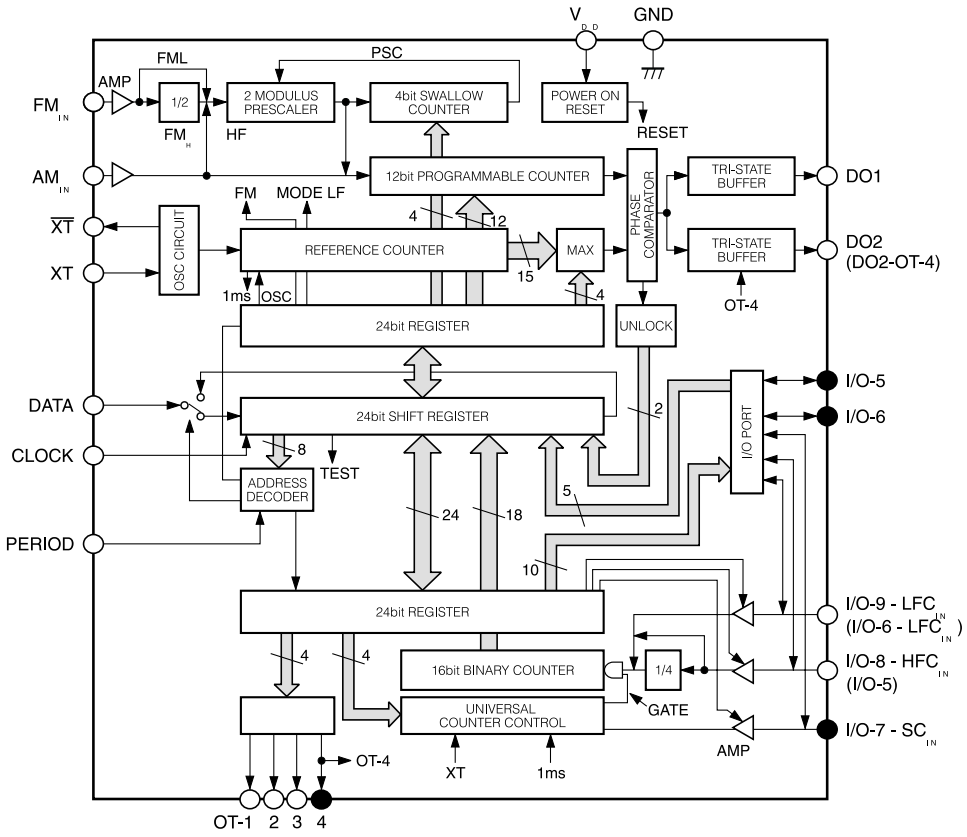




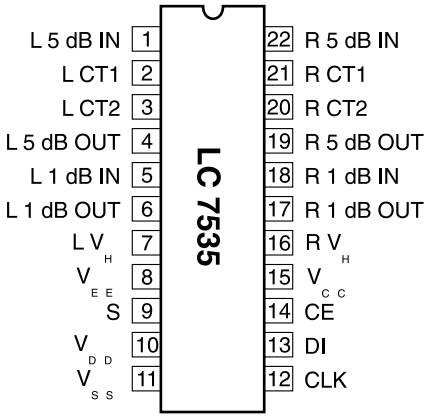
SOURCE INTEGRATED CIRCUIT DIAGRAMS (continued)

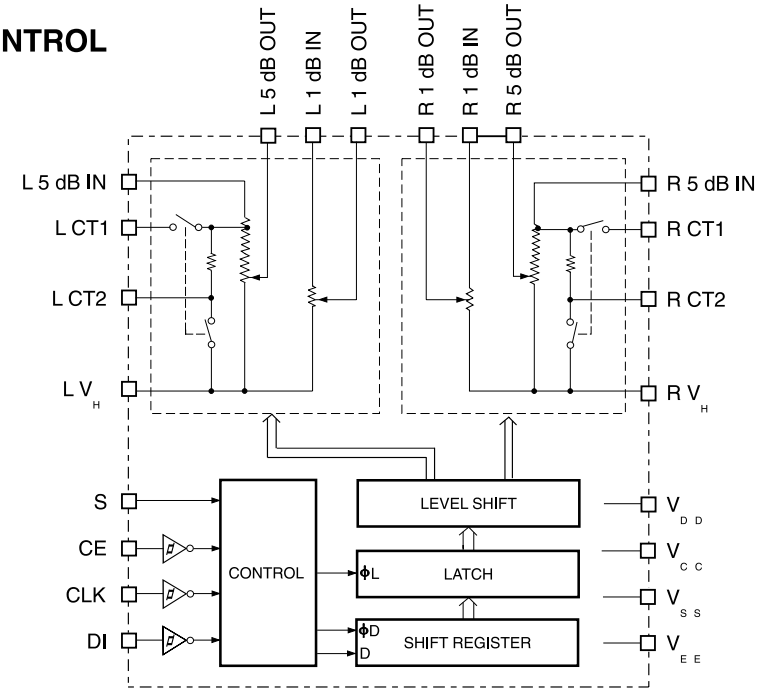
IC151 - TC9216P PPL w/PRESCALER





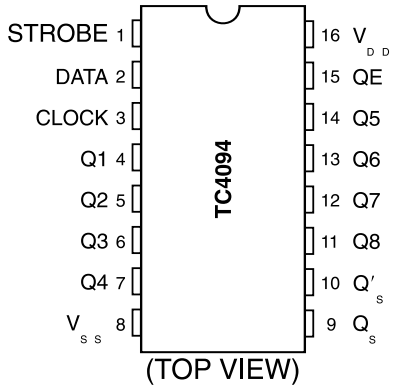
IC502 - LC7535 VOLUME CONTROL

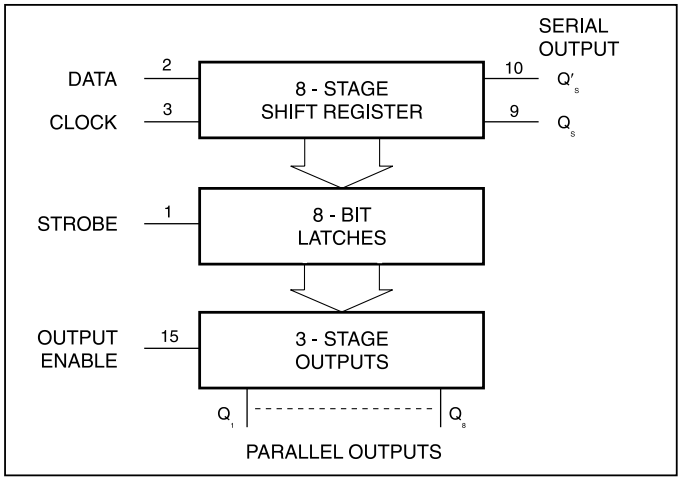




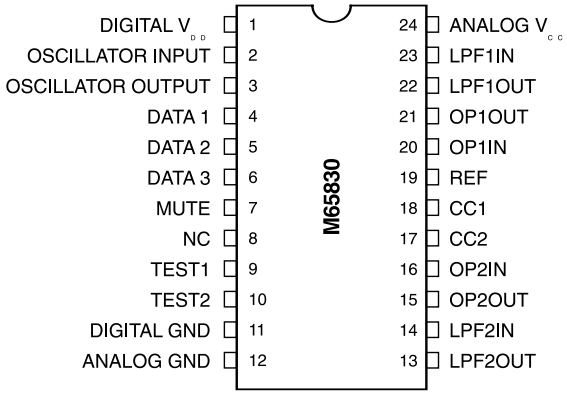
SOURCE INTEGRATED CIRCUIT DIAGRAMS (continued)

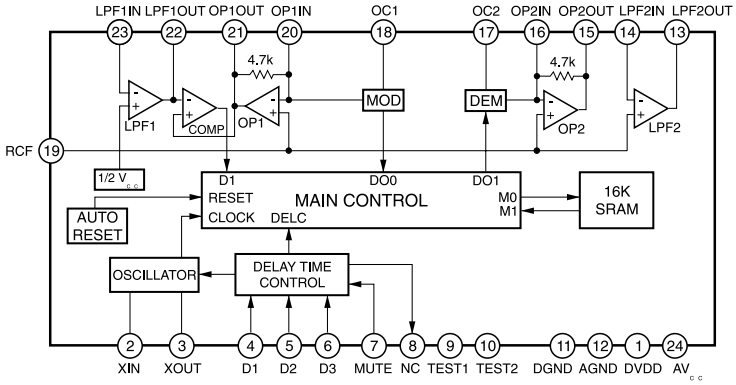
IC602 - TC4094BP 8 BIT SHIFT REGISTER



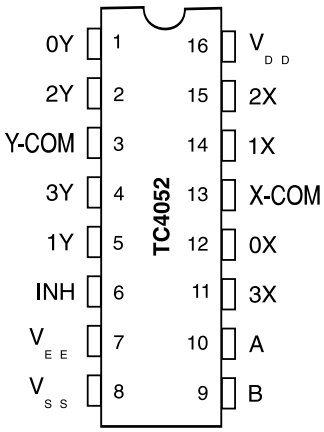


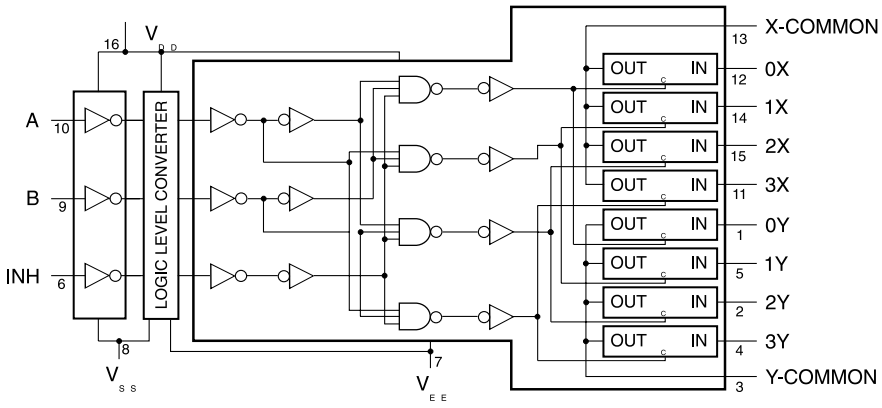
IC603 - M65830FP DIGITAL DELAY





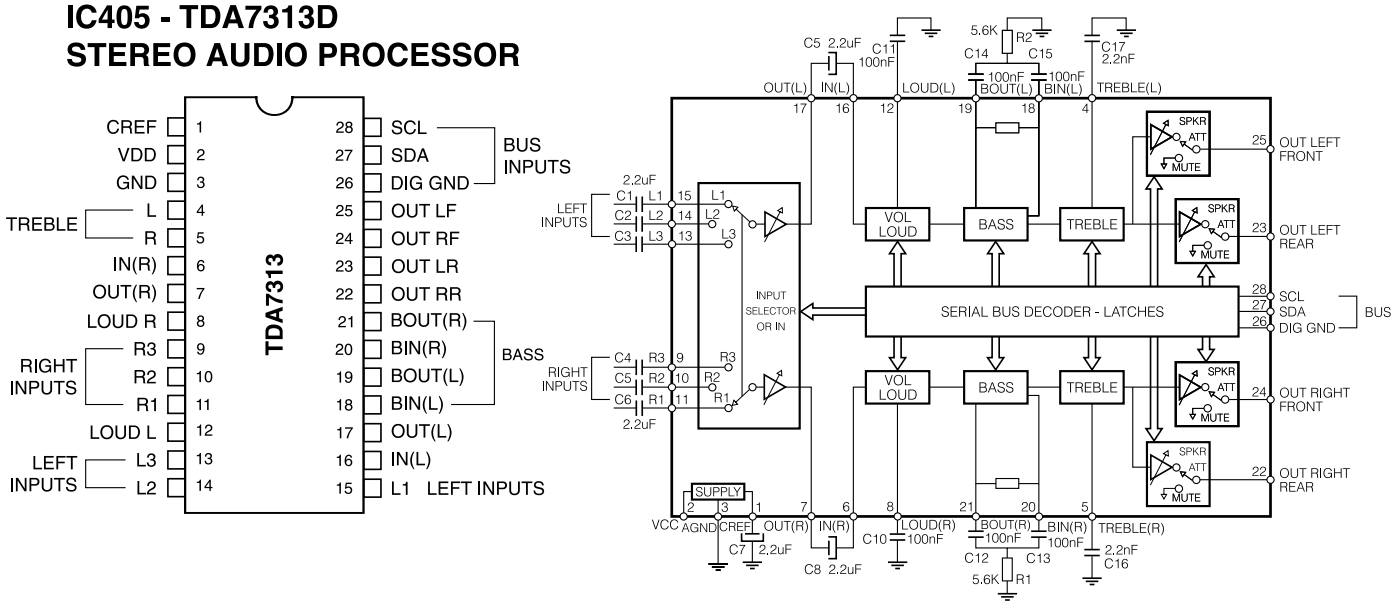
IC604 - TC4052BP 4 CH MULTIPLEXER



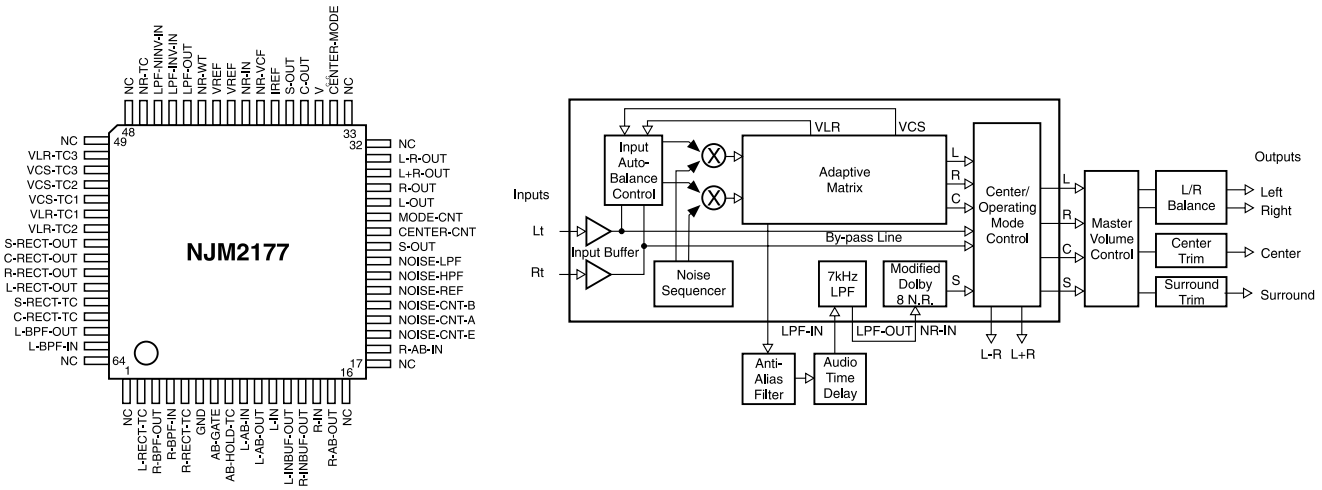


SOURCE INTEGRATED CIRCUIT DIAGRAMS (continued)

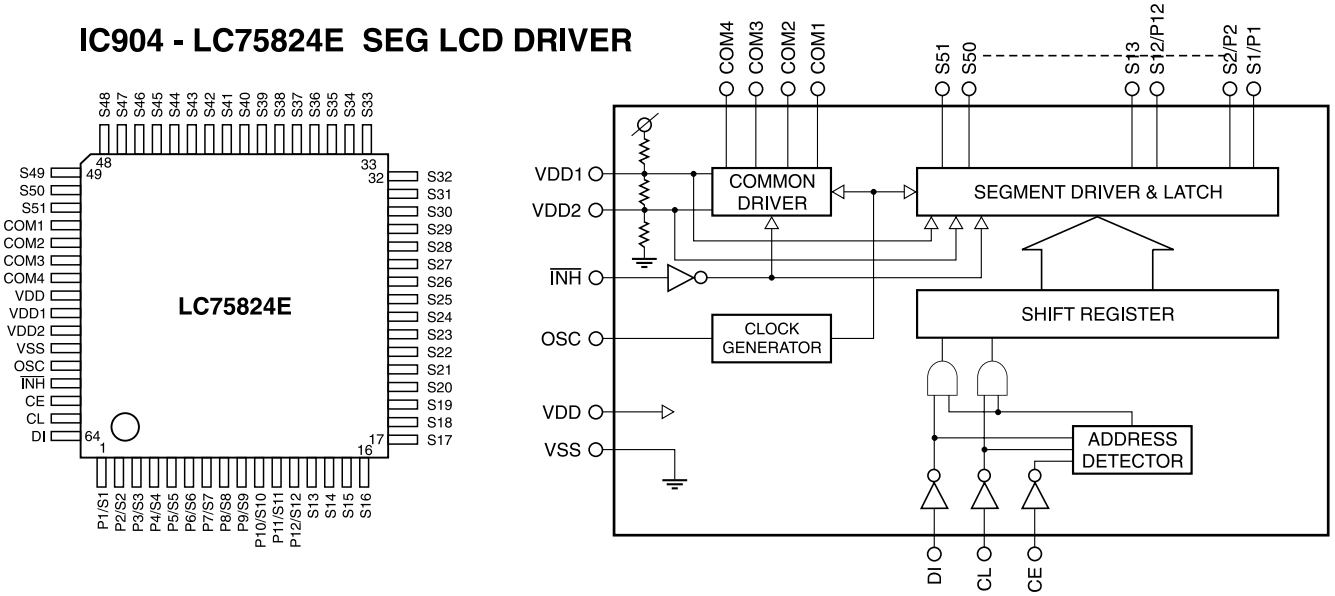
IC405 - TDA7313D
STEREO AUDIO PROCESSOR



IC601 - NJM2177AF DOLBY PRO LOGIC DECODER

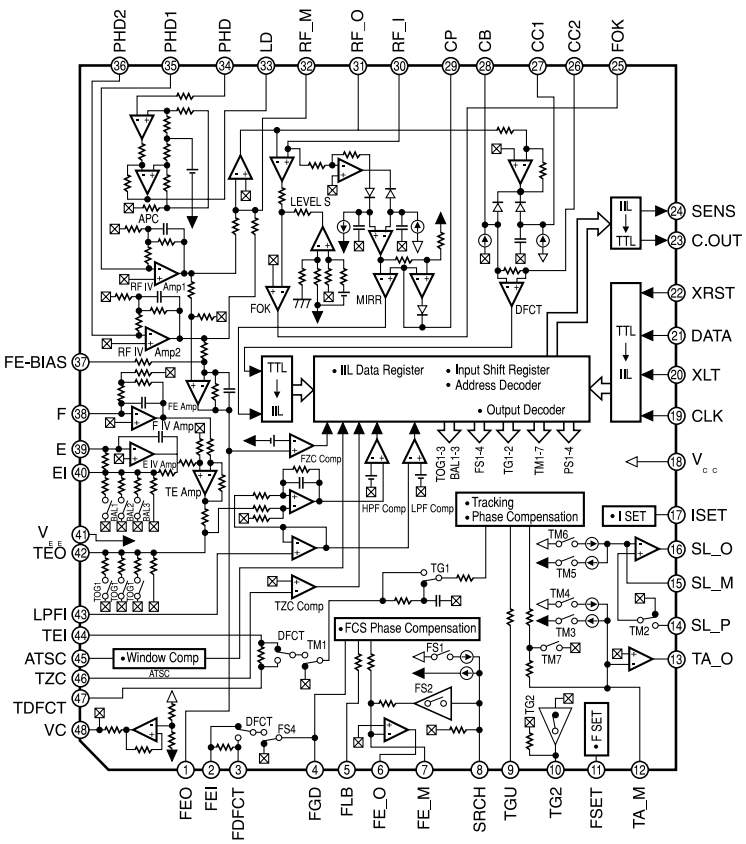


IC904 - LC75824E SEG LCD DRIVER

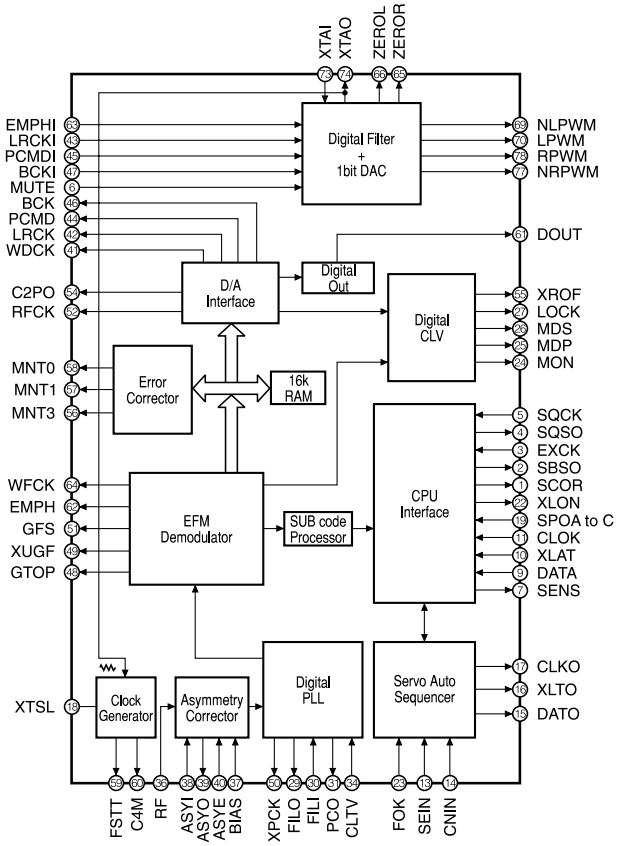

LC75824E
S48 S47 S46 S45 S44 S43 S42 S41 S40 S39 S38 S37 S36 S35 S34 S33
S49 S50 S51 COM1 COM2 COM3 COM4 VDD VDD1 VDD2 VSS OSC INH CE CL DI
S32 S31 S30 S29 S28 S27 S26 S25 S24 S23 S22 S21 S20 S19 S18 S17
P1/S1 P2/S2 P3/S3 P4/S4 P5/S5 P6/S6 P7/S7 P8/S8 P9/S9 P10/S10 P11/S11 P12/S12 S13 S14 S15 S16
COM4 COM3 COM2 COM1
S51 S50
S13 S12/P12 S2/P2 S1/P1
VDD1
VDD2
INH
OSC
VDD
VSS
COMMON DRIVER
SEGMENT DRIVER & LATCH
SHIFT REGISTER
CLOCK GENERATOR
ADDRESS DETECTOR
DI CL CE

SOURCE INTEGRATED CIRCUIT DIAGRAMS (continued)

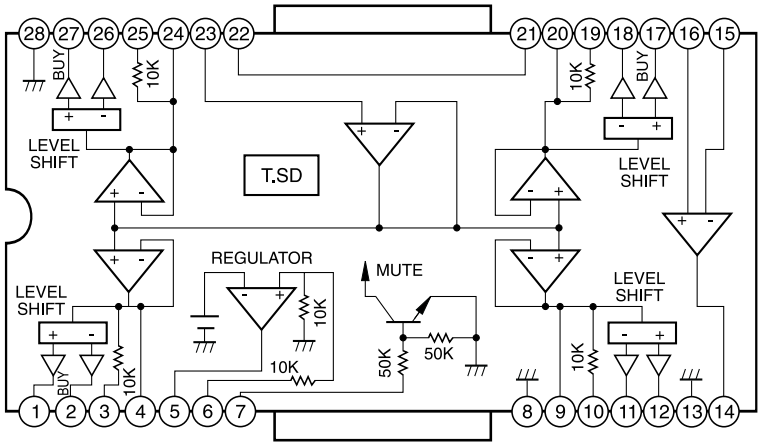
IC801 - CXA1782AQ
R.F. AMP + S.S.P.



IC802 - CXD2508AQ
D.S.P. + D.A.C.

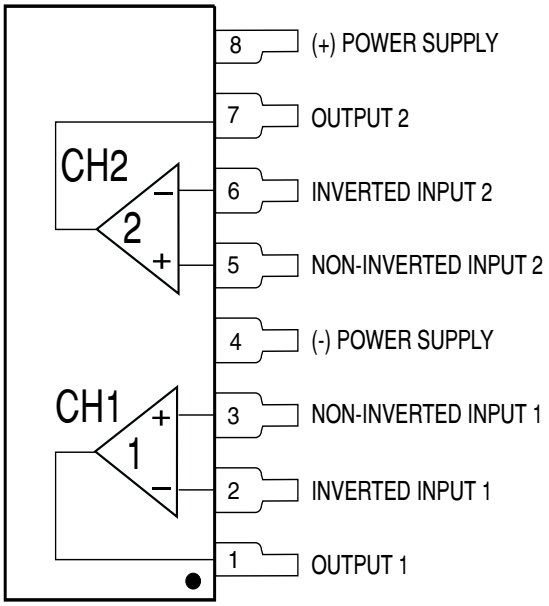


IC803 - KA9258D FOCUS/TRACKING DRIVER

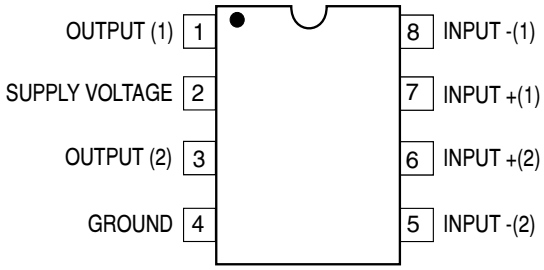


SOURCE INTEGRATED CIRCUIT DIAGRAMS (continued)

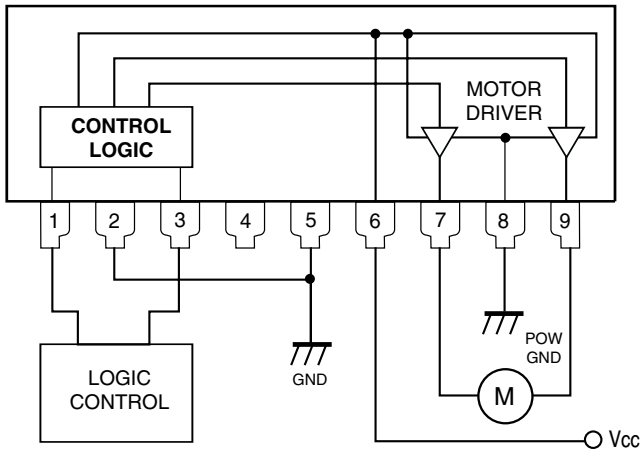
IC402, 403, 501, 503, 504, 605, 606, 805, 806 M5218AL or 4558L OP-AMP



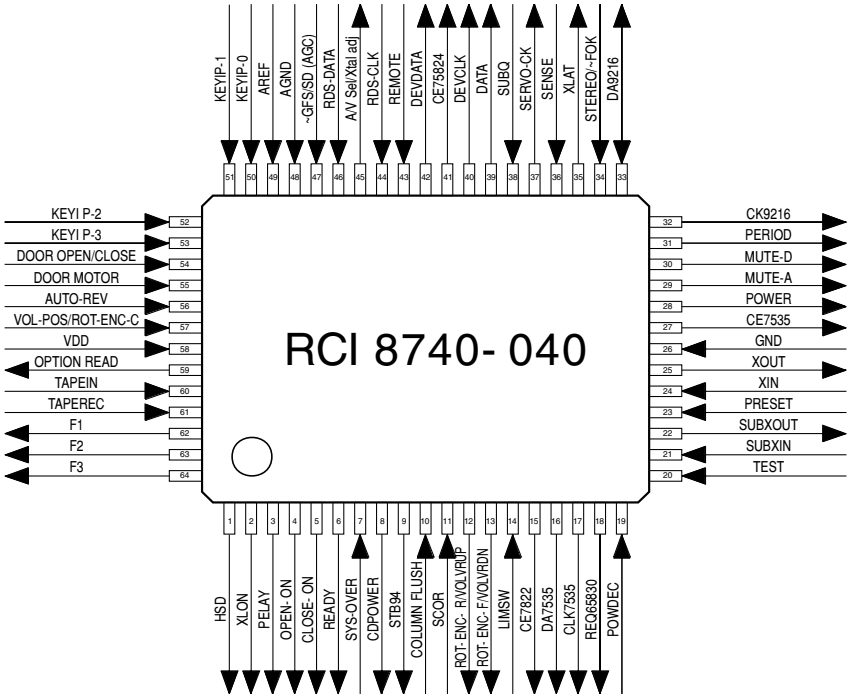
IC505 - TDA2822 POWER AMP



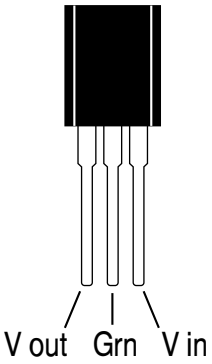
IC809 - BA6218 MOTOR DRIVER



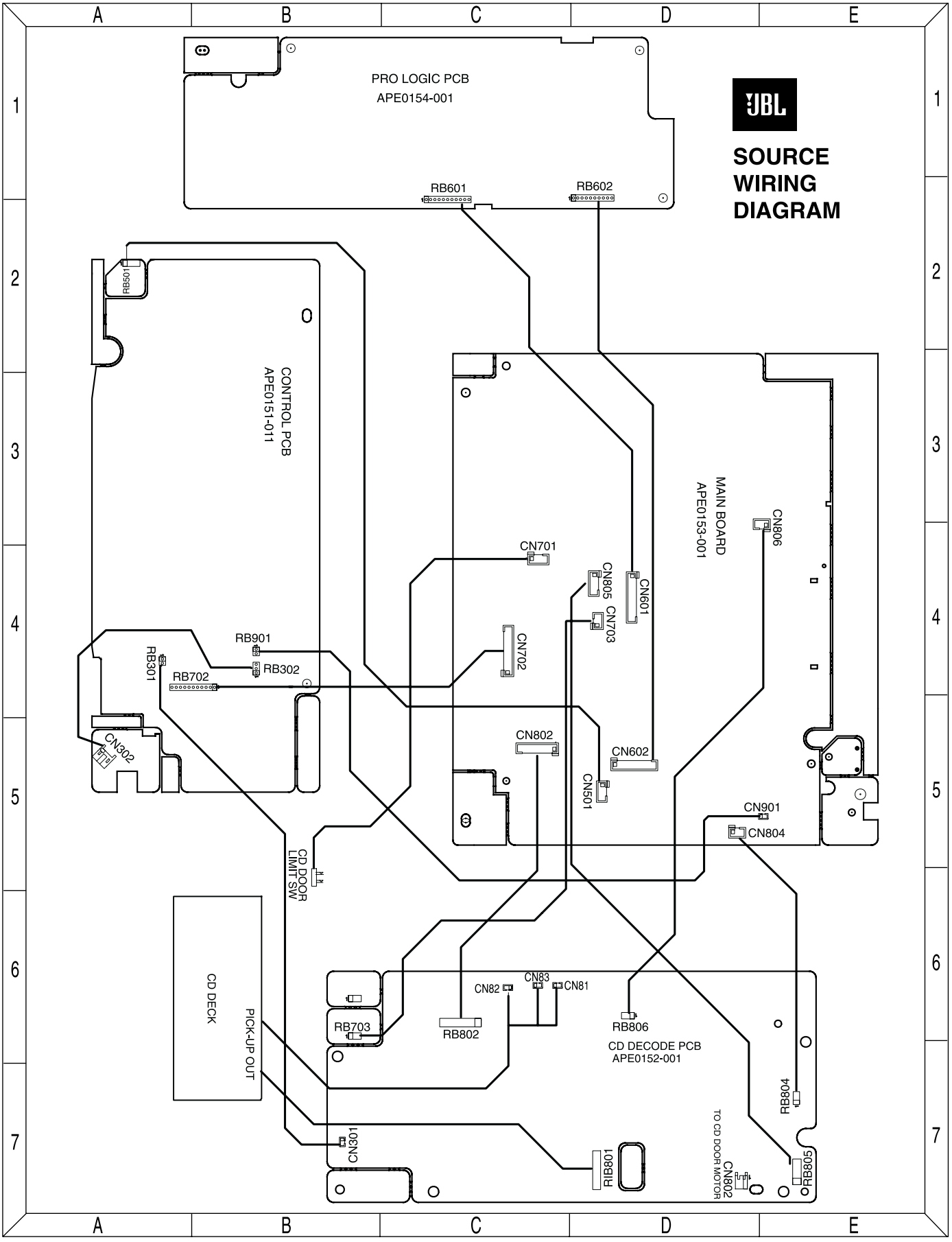
IC701, - TMP87M-040 MICROPROCESSOR

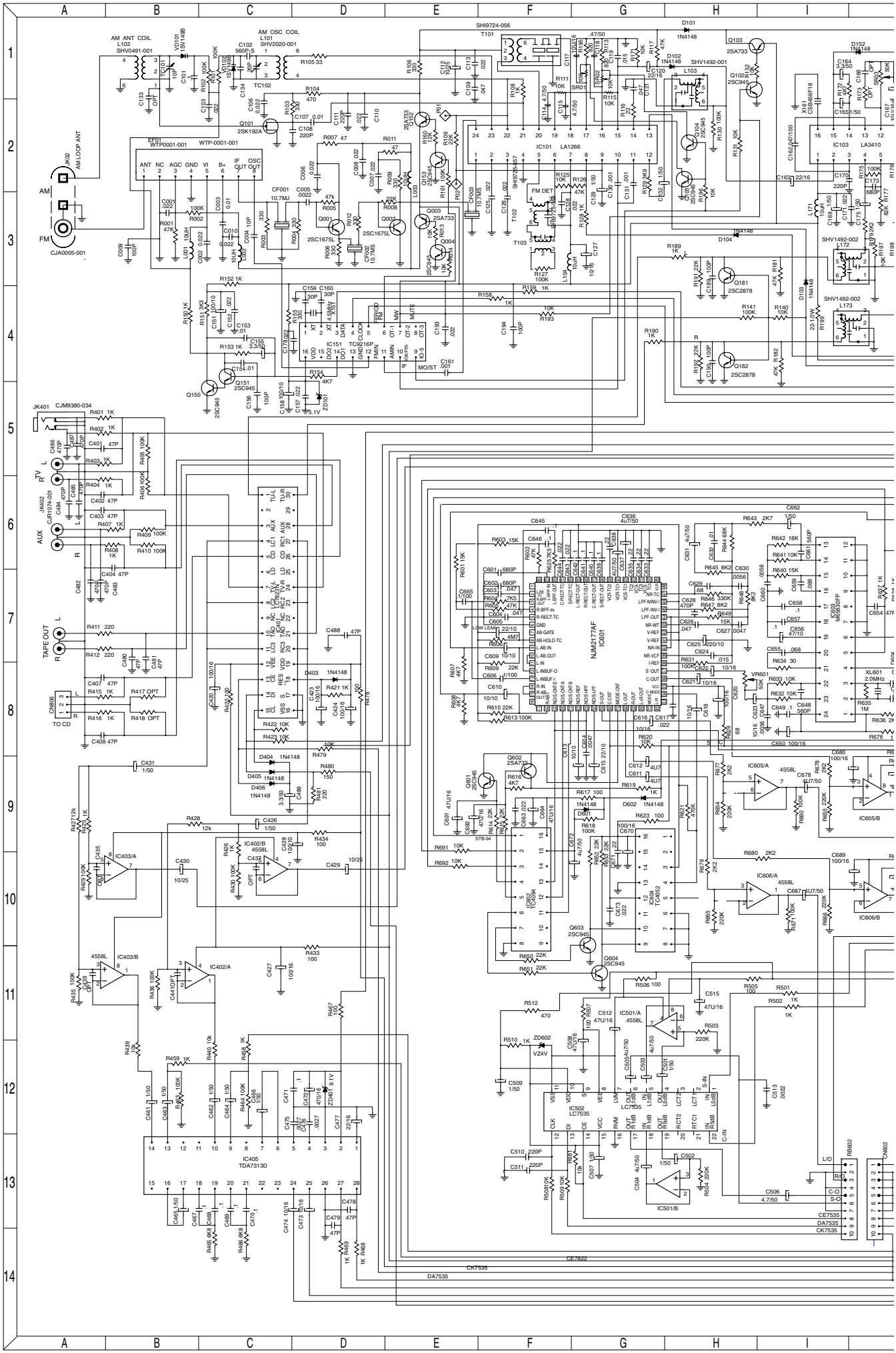


IC902 - 78I06 +6V REGULATOR

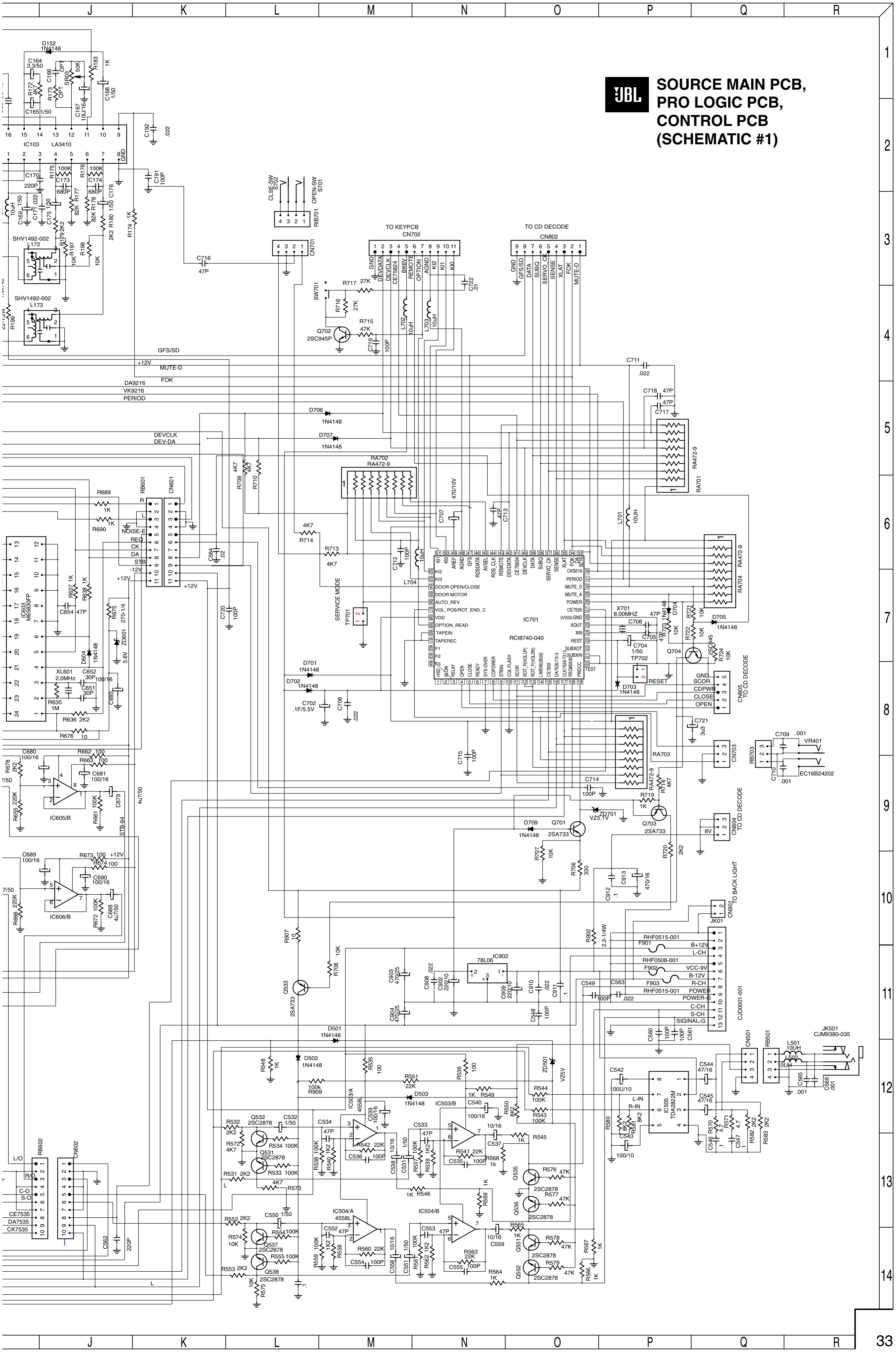


SOURCE WIRING DIAGRAM




AM ANT COIL
L102
SHV0491-001
AM OSC COIL
L101
SHV2020-001
SHI9724-056
T101
IC101
LA1266
IC151
TC9216P
IC601
NJM2177AF
IC405
TDA7313D
IC403/A
IC403/B
IC402/A
IC402/B
IC501/A
IC501/B
IC502
LC7535
IC604
IC605/A
IC605/B
IC606/A
IC606/B
IC403
IC404
IC602
IC603
M58340FP
XL601
2.0MHz
JK401
CJM9380-034
JK402
CJR1074-001
JK02
CJA0005-001
AM LOOP ANT
CN805
TO CD
TAPE OUT
AUX
TV
CN602
CE7535
DA7535
CK7535
CE7822
DA7535

SOURCE MAIN PCB, PRO LOGIC PCB, CONTROL PCB (SCHEMATIC #1)



J K L M N O P Q R
1 2 3 4 5 6 7 8 9 10 11 12 13 14
IC103 LA3410
D152 1N4148
SHV1492-002 L172
SHV1492-002 L173
CLSE-SW S702
OPEN-SW S701
RIB701
CN701
TO KEYPCB
CN702
GND DEVDATA DEVCLK CE75824 BK6V REMOTE OPTION AGND KI2 KI1 KI0
TO CD DECODE
CN802
GND GFS/SD DATA SUBQ SERVO_CK SENSE XLAT FOK MUTE-D
SW701
Q702 2SC945P
GFS/SD
+12V
MUTE-D
FOK
DA9216
VK9216
PERIOD
DEVCLK
DEV-DA
D706 1N4148
D707 1N4148
RA702 RA472-9
RA701 RA472-9
RA704 RA472-9
RA703 RA472-9
RB601
CN601
NOISE-E
REQ
CK
DA
STB
-12V
IC603 M65830FP
XL601 2.0MHz
ZD601 5.6V
SERVICE MODE
TP701
IC701
RCI8740-040
DOOR OPEN/CLOSE
DOOR MOTOR
AUTO_REV
VOL_POS/ROT_END_C
VDD
OPTION_READ
TAPEIN
TAPEREC
CK9216
PERIOD
MUTE_D
MUTE_A
POWER
CE7535
(VSS) GND
XOUT
XIN
REST
SUBXOT
SUBXIN
TEST
X701 8.00MHZ
TP702
RESET
Q704 2SC945
D701 1N4148
D702 1N4148
D703 1N4148
D704 1N4148
D705 1N4148
CN805 TO CD DECODE
GND SCOR CDPWR CLOSE OPEN
CN703
RB703
VR401
EC16B24202
IC605/B
IC606/B
STB-94
D709 1N4148
Q701 2SA733
ZD701 VZ5.1V
Q703 2SA733
CN804 TO CD DECODE
8V
CN901 TO BACK LIGHT
JK01
IC902 78L06
RHF0515-001
F901
B+12V
L-CH
RHF0508-001
F902
VCC-9V
B-12V
F903
R-CH
RHF0515-001
POWER
POWER-G
C-CH
S-CH
SIGINAL-G
CJD0001-001
Q533 2SA733
D501 1N4148
D502 1N4148
D503 1N4148
ZD501 VZ5V
IC503/A 4558L
IC503/B
IC504/A 4558L
IC504/B
IC505 TDA2822M
L-IN
R-IN
Q531 2SC2878
Q532 2SC2878
Q535 2SC2878
Q536 2SC2878
Q537 2SC2878
Q538 2SC2878
Q551 2SC2878
Q552 2SC2878
RB602
CN602
L/O
R/O
C-O
S-O
CE7535
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CN501
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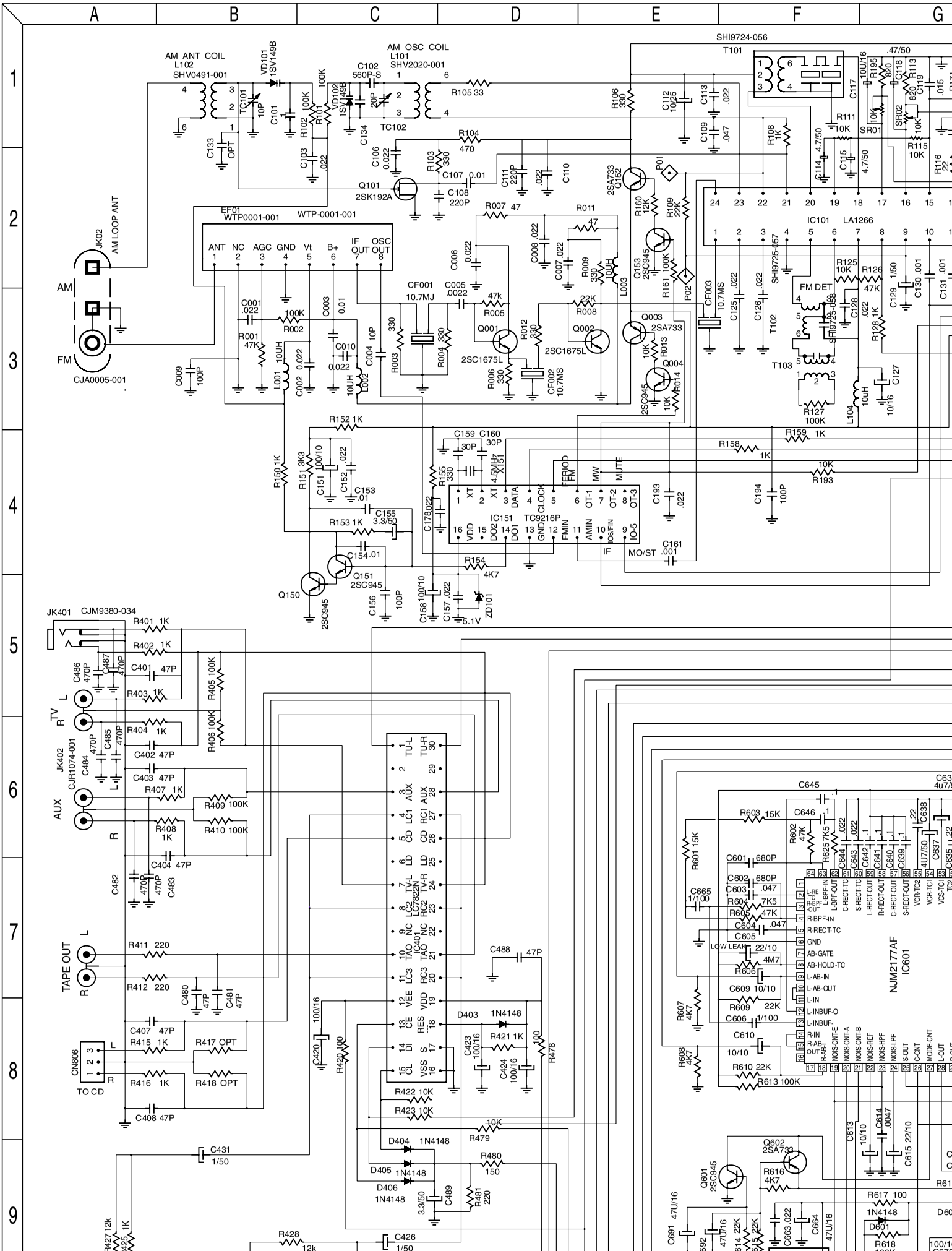
L502 10UH
JK501 CJM9380-035


A
B
C
D
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9
AM ANT COIL
L102
SHV0491-001
AM OSC COIL
L101
SHV2020-001
SHI9724-056
T101
IC101 LA1266
IC151 TC9216P
IC401 LC7822N
NJM2177AF
IC601
JK401 CJM9380-034
JK402 CJR1074-001
JK02 AM LOOP ANT
CJA0005-001
EF01 WTP0001-001
WTP-0001-001
CF001 10.7MJ
CF002 10.7MS
CF003 10.7MS
SHI9725-057
SHI9725-058
X151 4.5MHz
Q101 2SK192A
Q150 2SC945
Q151 2SC945
Q001 2SC1675L
Q002 2SC1675L
Q003 2SA733
Q004 2SC945
Q153 2SC945
Q601 2SC945
Q602 2SA733
ZD101 5.1V
CN806
TO CD
TAPE OUT
AUX
TV
FM
AM
FM DET
PERIOD
MW
MUTE
IF
MO/ST

14
13
12
11
10
9
8
7
A
B
C
D
E
F
G
TAPE OUT
AUX
CN806
TO CD
IC405
TDA7313D
IC403/B
IC403/A
IC402/A
IC402/B
4558L
IC401
LC7822N
IC602
TC4094
Q601
2SC945
Q602
2SA733
Q603
2SC945
Q604
2SC945
ZD401 9.1V
ZD602
VZ4V
IC502
LC7535
NJM2177AF
IC601
DA7535
CK7535
CE7822
STB-94
LOW LEAK
R601 15K
R602 47K
R603 15K
R607 4K7
R608 4K7
R609 22K
R610 22K
R611 100K
R612 22K
R613 100K
R614 22K
R615 22K
R616 4K7
R617 100
R618 100K
R421 1K
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R423 10K
R425 1K
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R427 12k
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R480 150
R481 220
R489 3.3/50
R507 100
R510 1K
R512 470
R650 22K
R651 22K
R652 22K
R653 22K
R681 10k
R691 10K
R692 10K
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C441 OPT
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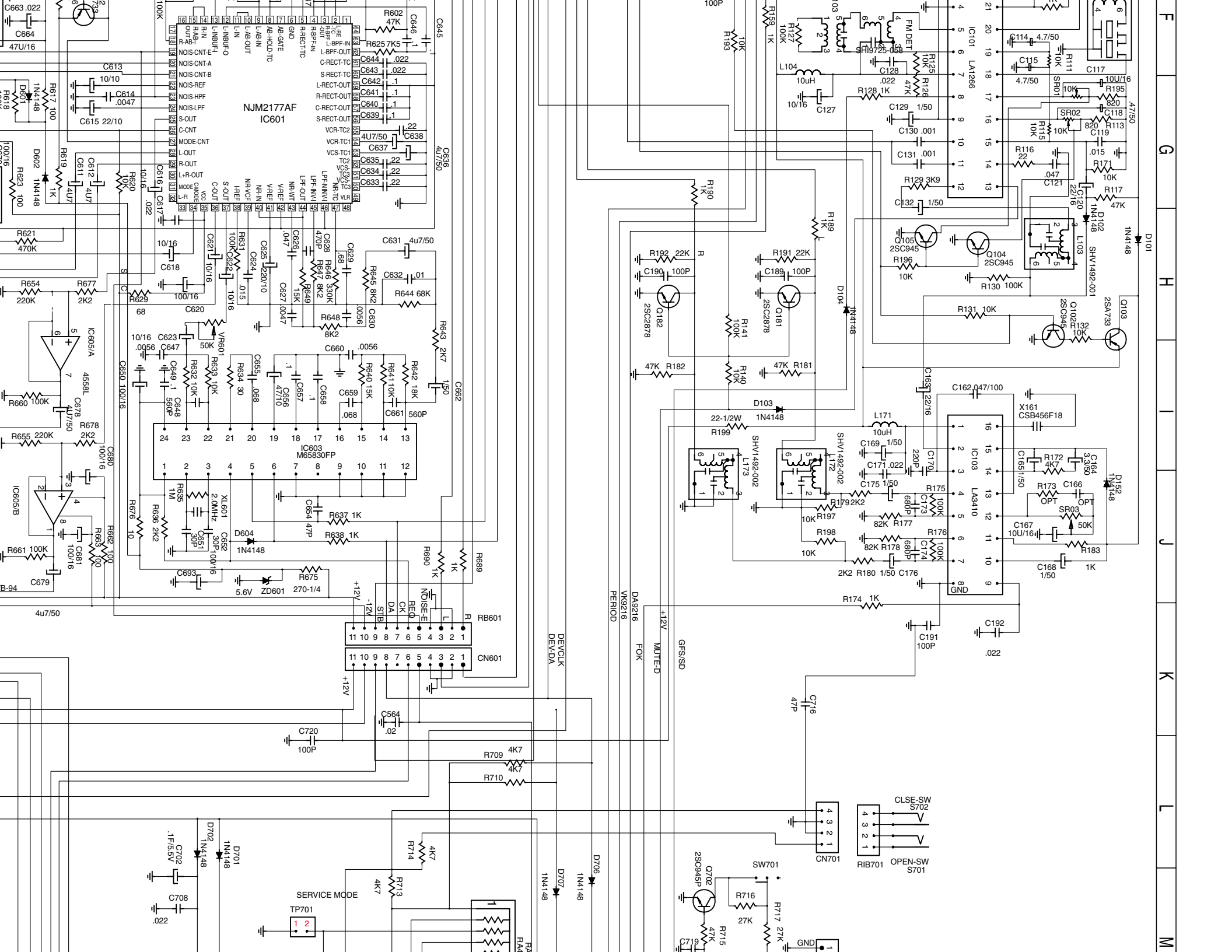
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IC103 LA3410
IC603 M65830FP
IC605/A
IC605/B
4558L
SHV1492-001
SHV1492-002
L101
L103
L171
L172
L173
X161 CSB456F18
FM DET
SRI9725-058
Q102E 2SC945
Q104 2SC945
Q105 2SC945
Q181 2SC2878
Q182 2SC2878
Q103 2SA733
Q702 2SC945P
D101 1N4148
D102 1N4148
D103 1N4148
D104 1N4148
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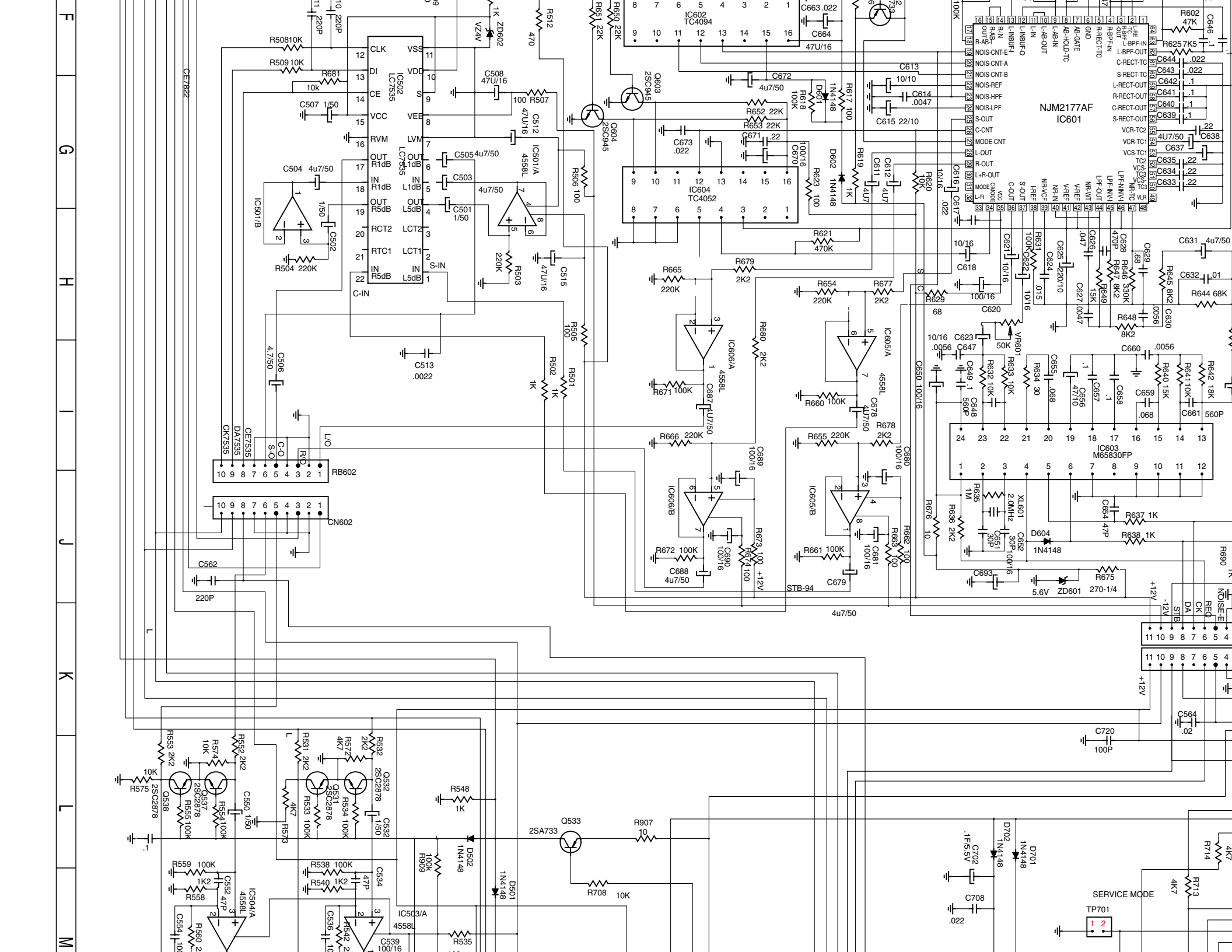
D601 1N4148
D602 1N4148
D604 1N4148
D701 1N4148
D702 1N4148
D706 1N4148
D707 1N4148
ZD601 5.6V
CN601
RB601
CN701
RIB701
TP701
SW701
CLSE-SW S702
OPEN-SW S701
SERVICE MODE
DEVCLK
DEV-DA
DA9216
VK9216
PERIOD
FOK
MUTE-D
GFS/SD
+12V
-12V
GND
STB
DA
CK
REQ
NOISE-E
L
R
F
G
H
I
J
K
L
M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IC603
M65830FP
IC604
TC4052
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IC605/B
IC606/A
IC606/B
IC501/A
IC501/B
IC502
LC7535
IC503/A
IC504/A
4558L
RB602
CN602
CE7822
CE7535
DA7535
CK7535
C-IN
S-IN
L/O
C-O
S-O
R/O
STB-94
SERVICE MODE
TP701
NOISE-E
STB
DA
CK
REQ
+12V
-12V
5.6V
ZD601
ZD602
VZ4V
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2SA733
2SC945
2SC2878
4u7/50
4U7/50
47U/16
4U7
10/16
100/16
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.0056
.0022
.0027
.0033
.0039
.0068
.015
.047
.068
.1
.22
.01
.02
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.033
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.047
.056
.068
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.1
.22
.27
.33
.39
.47
.56
.68
.82
1/50
10/10
22/10
47P
100P
220P
470P
560P
1K
1K2
2K2
4K7
8K2
10K
15K
18K
30K
47K
50K
68K
100K
220K
330K
470K
1M
2.0MHz
30P
10
30
68
100
470
1N4148
R50810K
R509 10K
R681
10k
R512
470
R650 22K
R651 22K
R652 22K
R653 22K
R654
220K
R655 220K
R656 220K
R657 220K
R658 220K
R659 220K
R660 100K
R661 100K
R662 100
R663 100
R664 100
R665
220K
R666 220K
R671 100K
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R674 100
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270-1/4
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10
R677
2K2
R678
2K2
R679
2K2
R680
2K2
R682 100
R683 100
R690
1K
R501
1K
R502
1K
R503
220K
R504 220K
R505
100
R506 100
R507 100
R508
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470
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R514
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R618
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D701
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D702
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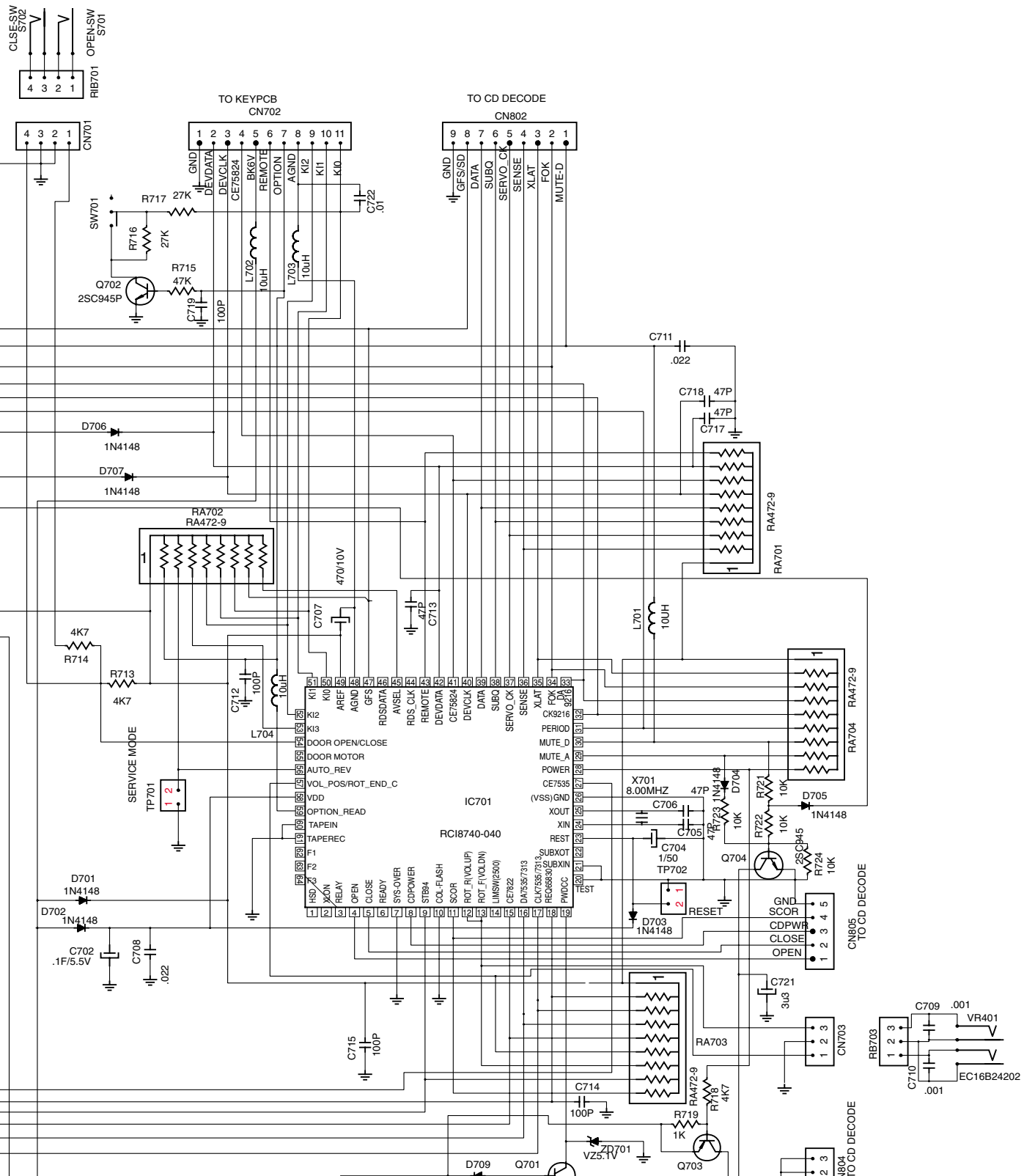
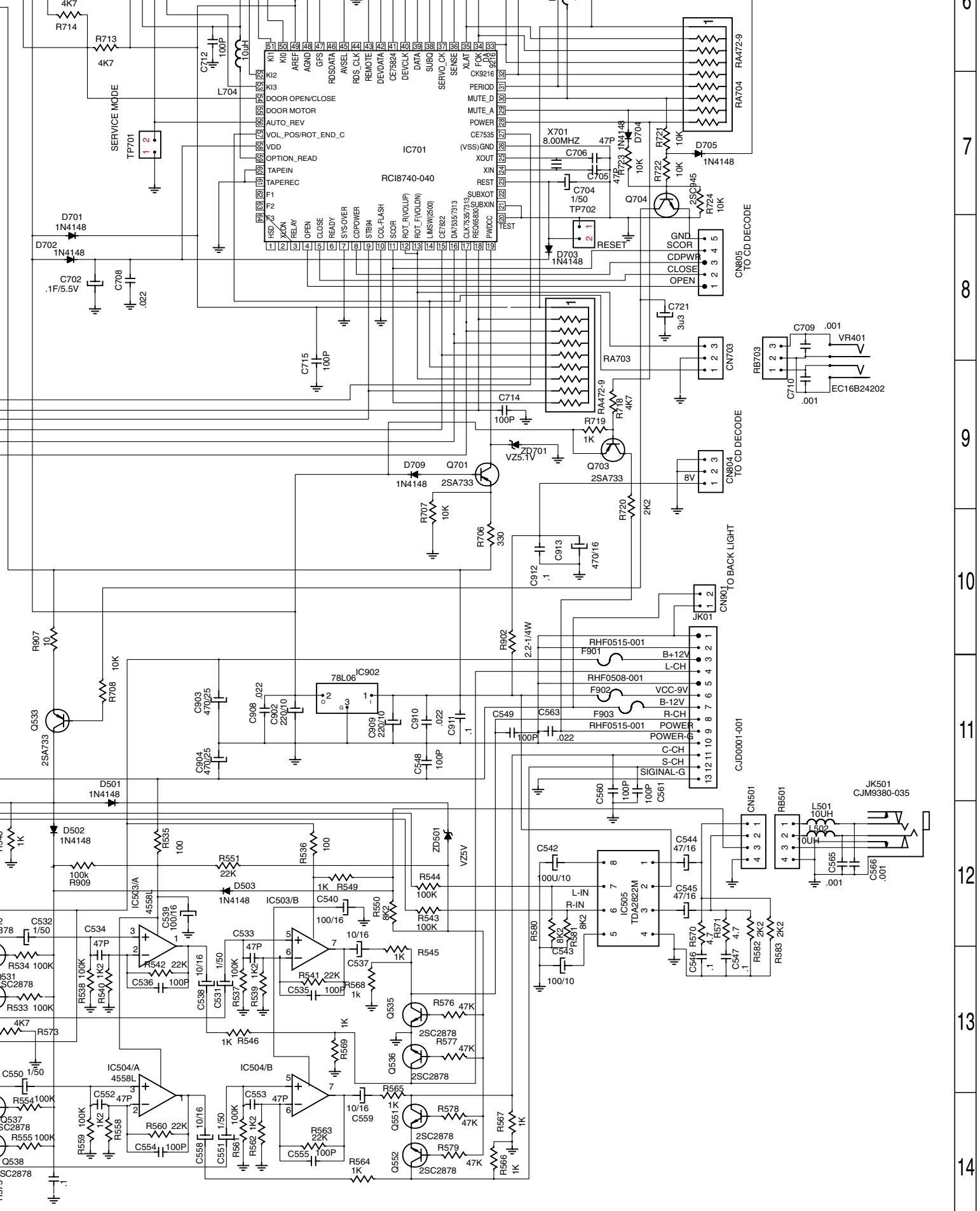
Q532
2SC2878
Q533
2SA733
Q537
2SC2878
Q538
2SC2878
Q603
2SC945
Q604
2SC945
VR601
50K
XL601
2.0MHz
100k
R909
R907
10
C-CNT
C-OUT
C-REC
C-REF
C-RECT-TC
C-RECT-OUT
C-RECT-IN
C-BPF-IN
C-BPF-OUT

SOURCE MAIN PCB, PRO LOGIC PCB, CONTROL PCB (SCHEMATIC #1)




IC701
RCI8740-040
X701
8.00MHZ
SERVICE MODE
TP701
L704
D701
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D702
1N4148
D703
1N4148
D704
1N4148
D705
1N4148
RESET
TP702
Q704
2SC945
CN805
TO CD DECODE
GND
SCOR
CDPWR
CLOSE
OPEN
RA704
RA472-9
RA703
CN703
RB703
VR401
EC16B24202
CN804
8V
Q701
2SA733
Q703
2SA733
ZD701
VZ5.1V
IC902
78L06
Q533
2SA733
CN901
JK01
TO BACK LIGHT
F901
RHF0515-001
B+12V
L-CH
F902
RHF0508-001
VCC-9V
B-12V
F903
RHF0515-001
R-CH
POWER
POWER-G
C-CH
S-CH
SIGINAL-G
CJD0001-001
CN501
RB501
JK501
CJM9380-035
L501
10UH
L502
10UH
IC503/A
4558L
IC503/B
IC504/A
4558L
IC504/B
IC505
TDA2822M
L-IN
R-IN
ZD501
VZ5V
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1N4148
D502
1N4148
D503
1N4148

L M N O P Q R

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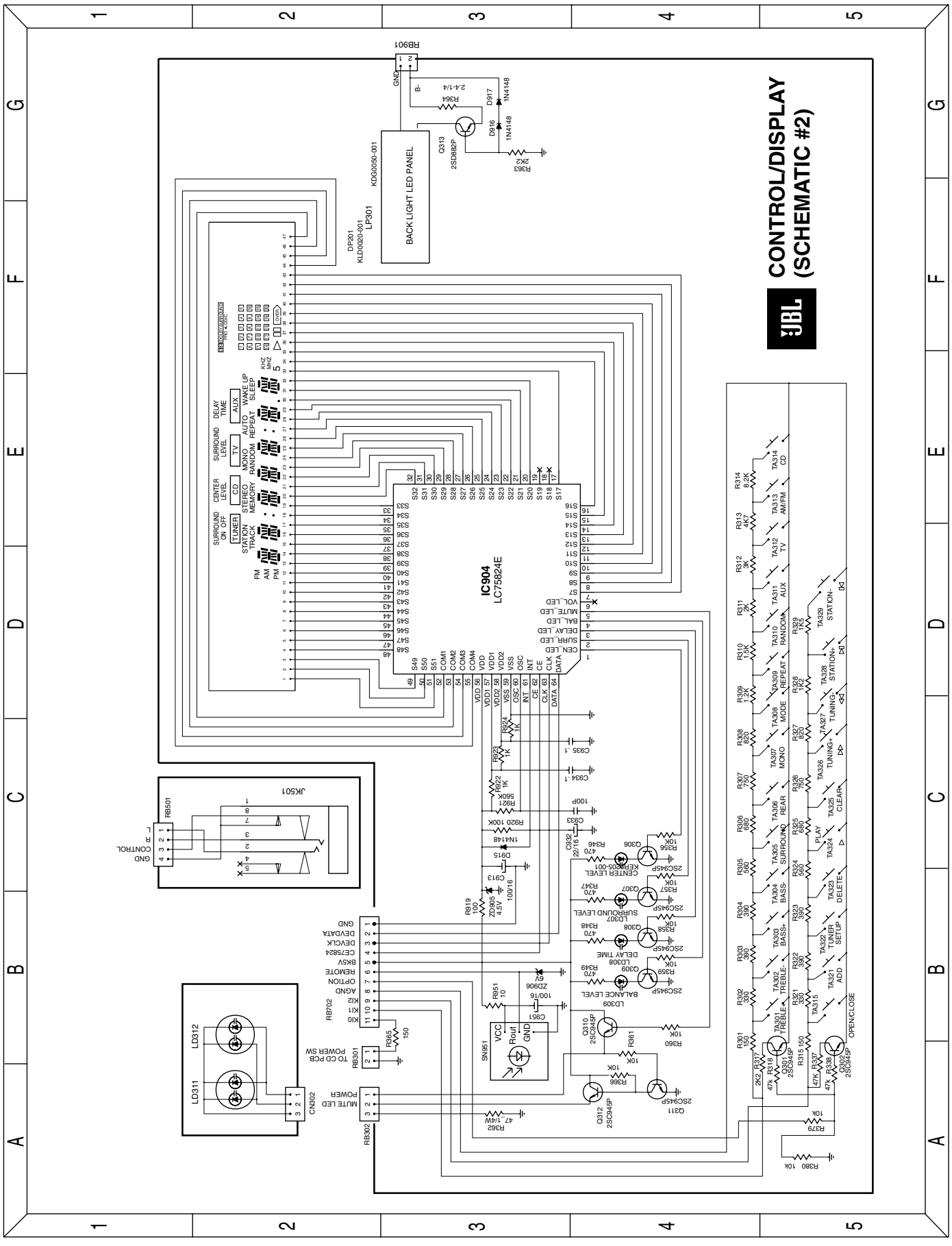
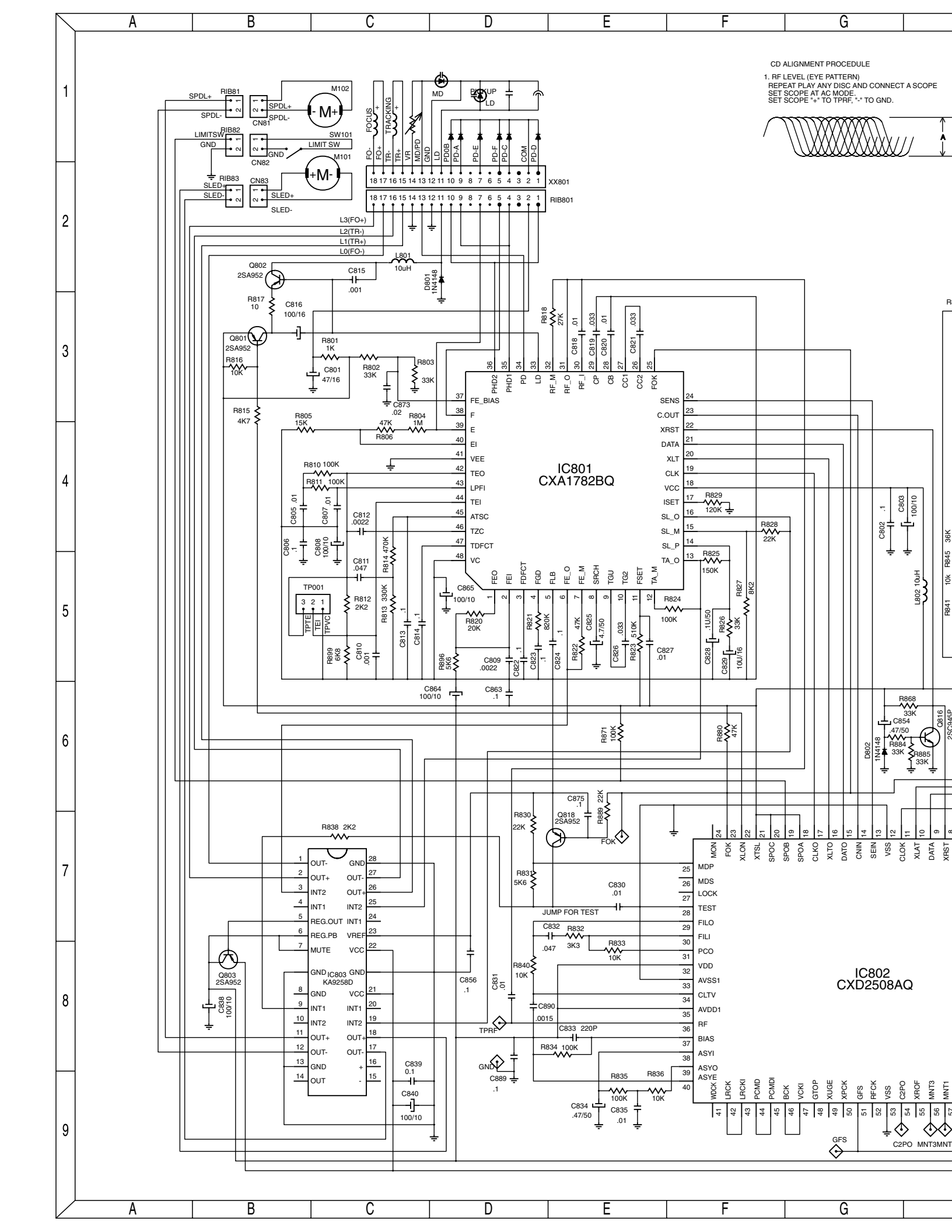
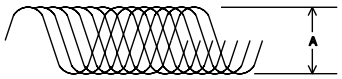
CONTROL/DISPLAY SCHEMATIC #2



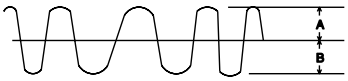

CD ALIGNMENT PROCEDULE
1. RF LEVEL (EYE PATTERN)
REPEAT PLAY ANY DISC AND CONNECT A SCOPE
SET SCOPE AT AC MODE.
SET SCOPE "+" TO TPRF, "-" TO GND.
IC801
CXA1782BQ
IC802
CXD2508AQ
IC803
KA9258D
JUMP FOR TEST
TPRF
GND
GFS
C2PO
MNT3
MNT1

CD ALIGNMENT PROCEDULE

1. RF LEVEL (EYE PATTERN)
REPEAT PLAY ANY DISC AND CONNECT A SCOPE
SET SCOPE AT AC MODE.
SET SCOPE "+" TO TPRF, "-" TO GND.



2. EF BALANCE
SET SCOPE AT DC MODE.
SET SCOPE "+" TO TPTE, "-" TO VREF.
TEI SHORT WITH TPVC.
CHECK DC BALANCE ON SCOPE (A B)



SOURCE
CD DECODER
(SCHEMATIC #3)

IC802
CXD2508AQ

IC805

IC806

IC809 BA6218

CN806 L G R

CN803

RB803

RB805 OPEN CLOSE CDPOWER SCOR GND

RB804 8V GND GND

RB802 MUTE-D FOK XLAT SENS CLOK SQSO DATA GFS/O

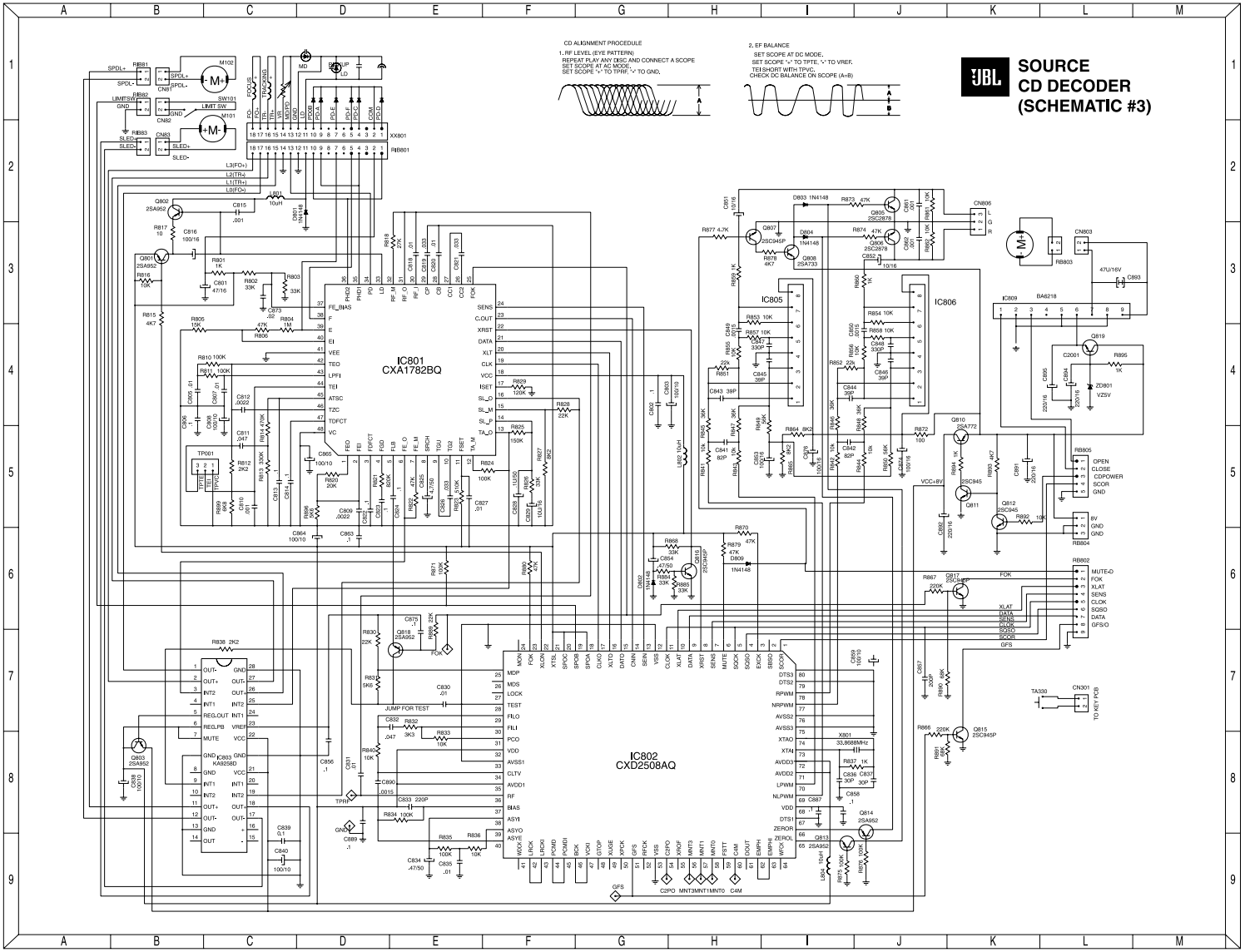
CN301 TO KEY PCB

TA330

VCC+8V

X801 33.8688MH

GFS

C2PO MNT3 MNT1 MNT0 C4M

SOURCE SCHEMATIC DIAGRAM #3